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Never Far from Home: Parental Assets and Migrant Transfers in Matlab, Bangladesh

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Abstract

Over the past generation, Bangladesh has experienced rapid transitions in mobility and fertility. In contrast to those of other Asian nations, these transitions have occurred largely in the absence of rapid economic development. As transition persists, there is concern that migrant financial transfers, a major source of parental support in many areas, will not persist. Of particular concern are 1) the possibility that transfer relationships, typically tied to broader forms of economic cooperation between migrants and origin households, will weaken as rural resources weaken relative to urban ones; and 2) that declining family size and declining family diversity will make it difficult for sons, and increasingly daughters, to spread the obligations of parental support between children and over the life course. The analysis uses descriptive results to demonstrate the importance of financial transfers in Matlab, a rural area of particularly high migration intensity. Statistical models then predict the determinants of parental receipt of any transfer and of transfer value in terms of characteristics of the parent and the adult child. In doing so, the models demonstrate migrants' dual obligations in looking after their parents' security as well as their own. While results demonstrate the robustness of the Bangladeshi family, they introduce cause for concern about the effectiveness of parental support mechanisms as well as the economic costs of demographic transition.

I. Introduction

Over the past generation, Bangladesh has experienced rapid transitions in mobility and fertility. The proportion of Bangladeshis living in cities has grown from 7.6% in 1971 to 18% in 1998 and the number of Bangladeshis living abroad at any given time has risen to approximately 2.5 million (United Nations 1995, 1996). At the same time, the Total Fertility Rate has decreased from 6.3 children per woman in 1979 to 3.4 in 1993 with only a slight gap between urban and rural fertility (Mitra et al.1994). As young age distributions continue to drive medium-term population growth, fertility decline shifts most of the growth to older ages.

While the causal linkages between these two transitions have yet to be fully explored, it is clear that the next generation of elderly rural Bangladeshis will not only have fewer overall children as sources of support, but a higher proportion of them living away from home. While rapid economic growth has allowed the elderly in other areas of demographic transition to substitute quality of children for quantity and financial transfers for personal care, economic growth has been slow throughout Bangladesh's period of demographic change. Outside urban areas, opportunities for non-agricultural earnings and returns to human capital have grown equally slowly. While migration does not necessitate a declining commitment by children to their elderly parents, distance and alternative economic opportunities impose a more complex social dynamic when compared to the relationship between children and parents in close proximity. Instead, continued parental support has often depended on the extent to which migrant children, constrained in their own opportunities for permanent urban settlement, can depend on their parents for long-term cooperation and inheritance.

This paper explores the determinants of migrant transfer receipts by elderly parents in Matlab, an area of highly developed migrant flows both to cities in Bangladesh and to numerous other countries. As perhaps the most important form of support offered by a migrant and as a potential engine of rural economic development, migrant transfers are a particularly relevant topic of study in such an era of change. The analysis will explore the impact of parental assets and income on aggregate transfers from all sons as well as on individual transfers from specific sons. In doing so, a major goal is to test whether low-income parents can expect transfers even

when they do not offer significant opportunity for exchange with children. Models also consider the role of migrant diversity in terms of total number, life-course diversity, and spatial diversity of migrant sons. In doing so, the analysis not only explores parents' current security arrangements, but how they condition children's own long-term security strategies. The analysis looks exclusively at migrant sons, the predominant source of transfers in this region, in order to focus on tradeoffs that operate between migrant siblings while other research focuses on tradeoffs between migrant sons other sources of support.

II. Addressing Theories of Transfer Behavior

This section outlines theoretical perspectives on the motivation to transfer income to a family member, with particular reference to transfers from migrants to their origin communities. These expectations are based on the competing but non-exclusive motivations of exchange and altruism. In looking at an aspect of parental security in terms of their children's own security needs, the analysis eventually focuses on the interplay between multiple sons at different life stages as they balance obligations to their parents and their own families.

Need-Based Transfers

Transfers may respond directly to parent's financial or consumption needs. This motivation is based on theories of ***altruism***, in which income, goods or time are transferred from one person in a group to another without future or past exchange (Becker 1991; Becker and Tomes 1976). This is an abstract psychological concept that can be tied to a number of motivations such as love, guilt, and obligation, or to a need to demonstrate to one's own children the importance of providing support (Lopes 1994; Stark 1995). Regardless of motivation, the important thrust is that parents will receive support regardless of past or future reciprocal support. A negative association between non-transfer income and transfer receipt provides support to this claim, but it can also indicate other possible explanations for transfer, not all of which suggest that parents in financial need can expect support without offering exchange.

Asset-income interactions

Positive asset/transfer associations can indicate two forms of parent/child security arrangements. The first arrangement involves ***insurance against risk***, in which children and

parents co-insure. In this case, parents having lower than expected income would receive transfers that could be repaid in periods of low son's income. Risk insurance is particularly effective with migrant sons since inter-regional and inter-sectoral variations in income shocks generate low correlation between parent and son's earnings. The "New Economics of Labor Migration" suggest that migration often serves as a remedy for failures in capital markets such as insurance and futures markets (Stark 1982; Stark and Bloom 1985; Stark 1991). In empirically testing migrant-parent risk insurance arrangements, Lucas and Stark (1985) find that origin households in Botswana are not only more likely to receive remittances if they own cattle (the primary form of wealth), but particularly if migrants are male and thus likely to actually inherit the cattle. Further, the flow of remittances to cattle-owning households increases significantly during droughts that might threaten the security of those assets.

One measure of a parent's ability to repay the transfer would be his/her holdings of income-generating assets while need for transfers could be indicated by income levels that fall below expectations based on asset holdings. To the extent that a negative income/transfer relationship holds only at high levels of parental assets, the relationship may be better characterized by a system of mutual benefit, leaving low-asset parents at continued risk. The relative importance of asset and income effects, as well as the curvature of the interaction between the two, can also determine whether a parent-child transfer relationship is not better characterized by a system in which strictly need-based motivations co-exist with children's self-interested concerns (see methods section for a more detailed treatment of curvature).

Another form of parent-child security arrangement involves the migrant's own ***old-age security***. By sending transfers, working-age children may cement their filial bond and ensure asset bequests. In a competitive land market such as Bangladesh's, transfers may also prevent the liquidation of threatened assets, leading to an asset-income interaction. Although urban migration in the historical developed country context often lessened children's dependence on parental assets, structural theories of international development suggest that these opportunities are far more limited in many Less Developed Country settings. In order to maintain low labor costs and remain competitive in export-enclave and subsistence production, employers in many

LDCs expect employees to conduct child-rearing and receive insurance against unemployment, retirement or disability through urban-rural linkages rather than through formal financial mechanisms (de Janvry and Garramon 1977). In countries with historically high rates of land ownership, rural-urban migrants practice circular migration, maintaining most of their nuclear families' consumption activities and all security formation in spite of shifting production to the urban area (Portes and Walton 1981; Shaw 1988 for a South Asian example).

Positive asset-transfer relationships are also likely if migrants are actively involved in joint investment activities with parents. Given that circular migration episodes are prevalent for both domestic and international migrants, migration may represent a short-term attempt to capitalize on a positive investment situation (e.g. significant land holdings, ample familial labor supply, agricultural profitability) in areas where credit market access is constrained. In the context of international migration from Mexico to the United States, landed households have been more likely to receive transfers (Durand et al. 1996). Other research has demonstrated that remittances are most likely to flow to households having the highest potential returns to productive investment of transfers (Taylor and Wyatt 1996). In looking at relative income and asset rankings in the statistical models, it may thus be possible that respondents receive transfers when both assets and incomes are high and an asset accumulation strategy is likely to be the best possible investment for both parent and child. The current analysis uses separate models of any transfer received and conditional value of those transfers, which allows a deliniation between small transfers, which may provide basic parental support, and larger ones, which may be more likely to secure parental assets or facilitate joint investment and exchange.

Influence of Past Transfers / Life-Course Security

If low parental income results from a tradeoff between productive assets and investment in children's education, then the income-transfer relationship may better represent a repayment of prior parental investments in children. In the absence of formal markets for old-age security in areas such as Bangladesh, parents may anticipate long-term returns to investing in children's future earnings (Stark 1995; Willis 1982; Caldwell 1976). In an economy with strong income returns to human capital, an investment in children's education may net greater long-term

income at a time when parents lose the capacity to generate income from agricultural assets or businesses (Lillard and Willis 1994). Rural parents may forgo future earnings by liquidating assets to pay for investments in children's education, business formation or, in the Bangladeshi case, international migration. In such a case, a negative income/transfer association may merely indicate the conscious replacement of personal income with transfer income rather than provision of truly need-based support.

Lacking measures of past parental expenditures on children's education or business formation, few cross-sectional surveys are ideally suited to understanding the relationship between past and present transfers. The best possible alternative is to measure repayment as a function of specific migrant attributes that derive from parental investments. A child-level analysis allows comparison of transfers to the same parent from children with divergent characteristics. The uncertainty of return on parental investments in children, however, makes these relationships difficult to interpret for two major reasons. First, the relationship between any investment enhancing migrant productivity and skills is affected by a positive education-income relationship, which on average increases transfers, as well as a possible negative effect of child's freedom from parental influence and resources on proportion of income transferred. Second, completed achievements such as education result not only from guided parental investments in children, but also from other non-financial personal motivations and investment tradeoffs, from societal norms, and from direct government regulations.[1]

In spite of the noise in the relationship between children's education and parental transfer receipt, an investment repayment hypothesis would still draw support from a positive education/transfer relationship and a positive interaction between education attainment and parental income. Successful control of the education/income interaction should also isolate the extent of truly need-based response to low parental income. These same techniques can be applied to modeling the interaction between parental income and international migration.

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[1] In their study of transfers from migrants in the Punjab in India, Oberai and Singh (1980) faced the issue of confounding associations between education and remittances. They found a positive association between education and the amount transferred, but a negative association with the sending of any transfers at high levels of attainment. The authors cite a "smaller degree of attachment with the home area" as the cause of this finding.

Spatial Distance / Shifting Reference Groups

A shift in a migrant's primary region of loyalty and economic focus can alter the overall intensity of transfer activity as well as the role of variables such as income and assets. While most migration episodes are initially undertaken individually, a large proportion of migrant sons in the upcoming analysis reside with their wives in the destination (referred to as "family migration"). Since most married individual migrants typically either return to their origin areas or are joined by their wives after relatively short spells, family migrants represent a large proportion of married individual migrants (Kuhn 1999).

The migrant's *conjugal status* (shorthand here for whether a migrant is unmarried, married but living alone in the destination, or married and living with his wife) is likely to determine transfer pattern as it affects the security and consumption strategies of each group. Family migrants, unlike married individual migrants, shift not only their conjugal family's productive activities to the city, but also their consumption. Since family migration is more likely to occur when the migrant's origin household has limited assets and community resources (low capacity to provide urban-rural security) or when the migrant himself has high educational attainment (low need for urban-rural security), family migrants also tend to shift the focus of their security relationships to the city (Kuhn 2000). While this shift in reference group from rural to urban neither eliminates the possibility of transfers nor even of urban-rural exchange, it is likely to condition the relationship between parental assets, income and transfers.

The economic and social situations of unmarried and married individual migrants are also likely to condition transfer behavior. Both groups are likely to balance the concerns of making financial investments in the respondent's household with financial and human capital investments in the destination area.[2] Married individual migrants, however, are more likely to send transfers since transfers to parents, particularly fathers, are likely to support their wives and children as well. Married individual migrants may also have less freedom to explore urban

[2] In qualitative interviews, individual migrants, particularly unmarried ones, were far more likely to be enrolled in school or undertaking more informal training activities such as apprenticeships. Apprentices typically received earnings at 0 to 20% of market value in return for future earnings or business formation assistance.

investment options because of their greater rural responsibilities.

Diversity of Support Options

To some extent, tradeoffs between these different motivations for transfer may be conditioned by the extent and flexibility of alternate parental sources of financial support. Increasing total number of migrant sons may increase the overall level of support that parents receive, or it may merely reduce the mean level of obligation for any one child. This reduction in obligation can be redistributed among sons, resulting in a form of economic linkage even among brothers who do not explicitly pool resources. Similarly, children who have benefited to a greater or lesser degree from specific types of investments such as international migration or education may take up their brothers' transfer responsibilities. A child may also suit both the amount transferred and the nature of his own income/asset/transfer response to the role best suited to his life-stage and to the availability of brothers playing complementary roles. In this regard, unmarried, married individual, and family migrants can be linked to three stages of economic life: 1) human capital accumulation, long planning horizons, and limited parental support; 2) high income, continued capital accumulation, and extensive parental support; and 3) high income, investment in own conjugal family, personal security formation. Models of migrant conjugal status will permit the analysis of one form of life-stage diversity.

III. Migration and Transfers in Matlab

An extensive literature on parental transfers in East and Southeast Asia, part of a broader cross-cultural literature on aging, has demonstrated the importance of substitution of quality of children for quantity and financial support for personal care in these settings of rapid social and economic change (Lillard et al. 2000; Lillard and Willis 1997; Lee, Parish and Willis 1994). In their 1997 paper, Lillard and Willis summarize this notion well:

> During the process of rapid economic growth, parents invest in the children's human capital and the children repay it on the basis of both the amount of the parents' earlier investment in them and the parents' current needs."

Such analyses, and the larger cross-cultural aging literature, suggest that economic growth facilitates tradeoffs, but does not address the causality, thereby limiting their applicability to a setting in which the tradeoffs are present in spite of limited economic growth, such as

Bangladesh. While these models do not make any assumptions pertaining to perpetual rapid growth, the absence of explicit models of parent/child resource competition enforce an expectation that rapid growth eliminates the need for such competition.

These analyses, and the family life survey data that facilitated them, directly guided the collection of the data used in this analysis. But in approaching an analysis of transfers in Bangladesh, three crucial aspects of Bangladesh's mode of economic development offer clues to how the process could differ in this setting. First, the lack of opportunities for economic gain or human capital return in rural areas makes the uncertainty of spatial separation a virtual necessity for making the sort of tradeoffs discussed in the aging literature. Second, less grandiose returns to human capital, weak job-based benefits, and high urban housing costs require migrants to depend on long-term backward linkages to rural areas for insurance against unemployment, return migration opportunities, and a setting for child-rearing. While such risk-management linkages were in evidence in other transitional Asian settings, economic growth obviated the need for comprehensive, long-term dependence (Greenhalgh 1985). Third, rapid increases in urban-rural ratios of population, resources, and growth could reduce the effectiveness of urban-rural cooperation, turning parent-child cooperation into parent-child competition.

The quantitative analysis is based on data from Matlab Thana, a rural area 55 kilometers southeast of Dhaka, the capital and one of the world's fastest growing cities.[3] In spite of the spatial proximity, a trip between Matlab and Dhaka takes six hours using conventional means of transport, making commuter travel impossible. Matlab's relative proximity to typical migrant destination areas reduced the costs and risks to migration, with subsequent multipliers in these advantages resulting from accumulation of migrant-specific social capital in specific neighborhoods and networks of high past out-migration.[4] Spatial proximity also reduces travel expenditures and opportunity costs associated with travel between destination and origin, reducing the costs and risks associated with active urban-rural cooperation through the following

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[3] Dhaka's population has grown from 1.3 million people at the time of liberation (1971) to over 8.5 million in 1997.

[4] The primary sending areas for urban migrants are located in southeastern districts such as Comilla, Noakhali, Feni, and Chandpur (Matlab's district), all lying 6-8 hours from Dhaka by boat or bus, and southwestern districts such as Barisal, Faridpur and Madaripur, all lying 15-20 hours from Dhaka by boat.

pathways: 1) greater contact between parents and children increases trust; 2) greater opportunities for migrant participation in rural agricultural activities increases migrant incentives to invest; 3) greater opportunity for men to remain alone in the city even after marriage permits longer spells of individual migration.[5] Matlab, like many other areas of Southeastern Bangladesh, sends a number of international migrants to countries in the Persian Gulf and Pacific Rim, where strict regulations on permanent settlement create a strong incentive for continued cooperation with family in the origin area.[6]

Migration is a major aspect of economic and social life in Matlab. In a qualitative study of migrant-sending villages conducted in 1998, almost no adult male could claim that neither he, his sons, his brothers, nor his father had ever spent six months or more in a city or another country. The process has had a major role in slowing population growth and density in the DSS area in spite of high rates of return migration (Figure 1). Between mid-1982 and 1996, migration removed a net total of 40,327 people, of which 25,598, or 63% of this number, was due to migration to cities. The net urban migration over this period counterbalanced 51% of the substantial natural increase that occurred. In 1996, the sex ratio at ages 25 to 34 was 78.4 men to 100 women (Mostafa et al. 1998).

Matlab's ecological and economic backdrop conditions the practice of rural-urban migration and the utility of transfers. Like most rural areas of developing countries, markets for agricultural credit, insurance, securities, and old age finance are not well developed. The landscape of Matlab, like that of most of Bangladesh, is flat, deltaic, and highly fertile. While catastrophic floods occur occasionally, causing property damage and forced migration, more notable are the yearly floods that structure much of social, cultural, and economic activity in the area. During the flood season, from June until October in the western calendar, all lands in

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[5] Matlab is also a major source of migrants for Chittagong, the second largest city and major port (eight hours away); Comilla, the closest city and regional focus of identity for most Matlabis (three hours away); Narayanganj, the historic center of the Bangladeshi textile industry (five hours away); and Chandpur, the district headquarters and a historic river port (one to two hours away).

[6] In one of the qualitative study villages, it appeared that as much as fifteen percent of all adult males are living abroad, primarily in Middle Eastern countries, but also in Malaysia, South Korea, Pakistan, Italy, Greece, United States, etc. This village actually has its own international phone office in spite of only recently getting electricity. Most other villages have more modest participation in international migration flows.

Matlab, other than homesteads and orchards, are submerged, as the primary rice crop is fertilized beneath the water. During this period, communication between compounds and with other areas virtually ceases, and sharp seasonal fluctuations emerge in commodity prices, local wages, fertility, and mortality (Chen 1979).

Small landholders and sharecroppers typically finance agricultural investments and growing season consumption through informal credit arrangements fixed in terms of the high pre-harvest price of rice and repaid in terms of the low post-harvest price, creating high costs and high risks for agricultural production (Jensen 1987; Jahangir 1979).[7] Default on these loans often sends households into a cycle of mortgage and eventual sale of agricultural lands, where debt service, consumption and risk stay constant while productive assets gradually diminish. For households operating at or below agricultural profitability, migration and associated financial transfers permit self-finance of agricultural inputs and consumption during the growing season rather than taking informal credit. For profitable households, transfers facilitate asset accumulation either through capital investments or entry as creditors into the informal market.

While public works projects and the presence of ICDDR,B have increased the scale of Matlab's non-agricultural economy, large-scale access to income-earning employment and returns to human capital largely exist outside the area, primarily in Dhaka and abroad. Table 1 demonstrates the dominance of migrant sons in the provision of financial support by presenting the accounting of transfer and non-transfer income among sampled respondents. Although the traditional preference for sons and daughters-in-law (over daughters) in the provision of elderly support is reflected in co-residence patterns and provision of care from children living in close proximity, financial transfers are unimportant for both sons and daughters living inside the same district. As a group, sons and daughters living in the same district, while accounting for over half of all non-household children, account for only 3% of total net transfers.[8]

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[7] Under this system, loans include not only the inherent disadvantage of seasonally fixed principal, but a high correlation between crop failure and the price at which repayment is ultimately fixed (assuming correlation between own crop failure and other's crop failures).

[8] The limited impact of transfers from these children can largely be attributed to the absence of income-earning opportunities for these children, to spatial diversification arrangements, to parental investment tradeoffs, and to tradeoffs of financial support for personal care. These are important topics for future study.

Among children living outside the district, sons who cannot fill the typical role of parental support instead send significant amounts of transfer income. The average respondent received tk1,511 (US$33) per year from children living outside the district while receiving tk5,928 ($131) from international migrant sons. Parents who actually had a migrant son received tk2,861 ($64) from internal migrant sons and tk11,225 ($249) from international migrants. In contrast, daughters living outside the district or country account for a combined net tk231 ($5), although contributions can be large when any transfer is sent. This gap may result in part from sons' greater income earning opportunities in destination areas as well as from daughters' primary obligations to their husbands' families. Accounting for transfers from all possible personal and institutional sources, the average respondent received 94% of a sizable net transfer flow from sons living outside the district or country. For a respondent at the mean level of total income, transfers from sons outside the district or country accounted for 19% of all income. For respondents having any migrant son, this proportion rose to 32%. Among respondents who received any transfer from migrant sons, the proportion rose to 49% (not shown).[9]

While rural market failures explain parents' *demand* for migrant transfers, the actual provision of transfers must also be explained by urban market failures that enforce mutually beneficial urban-rural financial relationships. Migrants to Bangladeshi cities remain exposed to economic risk because of low salaries, high job turnover, and insufficient formal benefits. Inadequate provision of job-based retirement and disability benefits, inadequate urban housing construction, and inadequate housing loan markets make permanent urban settlement difficult for many migrants, forcing them to depend on rural resources in much the same way as their non-migrant brothers. International migrants, on the other hand, are exposed to threats of unemployment, deportation, and unexpected visa expenses.

These short-term economic threats provide incentive for migrants to participate in co-insurance relationships with origin household members in spite of having a higher expectation of

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[9] These figures for proportion of income, taken at the mean, assume no income-transfer relationship. Respondents whose households are in the bottom half of the income distribution actually derived more net earnings from transfers than they did from their economic activities.

earnings and greater returns to experience and skill. In studying remittance patterns in Kenya, Rempel and Lobdell (1978), observe the role of remittances both for recipient and migrant.

> Remittances can be seen as the means of cultivating those social ties that are important in easing reentry into the home community... remittances become insurance premiums paid to protect the migrant against the problems which could arise if current urban employment is lost because of lay-offs, disability, or illness. The possibility of such insurance politices exists only in those societies where some viable rural alternative is still available to the migrant.

As a result of these urban market failures, the dominant pattern of rural-urban migration in Bangladesh is circular (Afsar 1994). Migrants from Matlab to urban areas of Bangladesh have high rates of return migration in the years immediately following migration (Figure 2), as in most international migration systems (Massey et al. 1997).[10] In Matlab, migrants continue to have high return rates even several years after migration. As suggested in the discussion of the relationship between migrant conjugal status and security formation, married individual migrants have higher rates of return migration that persist for a longer period following migration. While no return migration data are available for international migrants, political restrictions on long-term residence in primary destination countries make return migration a near certainty.

IV. Data and Methods

The analysis of respondent transfer receipt focuses exclusively on transfers from male migrant children. This specific focus on migrants is justified by the important distinctions between migrant transfers and other transfers. A large majority of all gross transfers and almost the entirety of net transfers come from migrant children. While transfers from non-migrant children are relevant, flows can largely be characterized as bi-lateral and must typically be viewed within the context of a package of transfers in cash, in kind, and in time. Migrant transfers can be distinguished from other transfer not just by the size of the flow but by the uni-directionality of the flow, by migrants' overwhelming advantage in access to cash income, and by the strong expectation that migration from Matlab is itself a highly endogenous process frequently intended

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[10] Survival curves of return migration are based on Matlab DSS data for out-migration episodes initiated between 1982 and 1984. Return migration is measured by re-entry into the DSS system, with censoring for termination of DSS observation but not for death (and thus understating return).

to generate transfers. Migration also results in separation between respondents' and migrants' asset holdings and productive activities, creating a clear temporal distinction between the two parties' income production functions and asset holdings.

The focus on migrants is also justified by future changes in the practice and process of migration. All projections of urbanization and economic growth suggest that migration will continue to gain importance as a source of income and as a source of transfers. At the same time, declining rural assets and increasing opportunities for secure urban employment may reduce migrant incentives for urban-rural cooperation and increase the inherent uncertainty of the economic connection between migrants and respondents. An exclusive analysis of transfers from migrant sons will permit a specific study of the tradeoffs between migrants at different life stages and in different locations, all of which will require the use of interaction terms at a level of complexity that could not be presented in the context of similar diversity tradeoffs between migrants and non-migrants or between sons and daughters. Analysis of transfers from all children is reserved for future work.

As discussed in the background section, the analysis will focus on the role of respondent assets and income in predicting the likelihood and value of transfers. The analysis will measure the respondent's household's *relative within-sample ranking* (measured as a percentile) in terms of agricultural assets, homestead assets, and total household income. While the use of relative ranking eliminates the possibility of predicting the impact of hypothetical changes in household assets and income, it anchors the relationship between assets and income to a fixed frame of reference. When modeling asset/income interactions, the difference between the respondent's household income ranking and asset rankings can be viewed as an indicator of how well the household's income has performed relative to the expected income and consumption.[11]

Bangladeshi ecology offers a natural window into the role of parental assets in migrant

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[11] In interpreting relative income and asset rankings, an increase in transfer activity to respondents with high asset rankings and low income rankings relative to their asset rankings might indicate that these households have higher consumption needs than deficit households with lower asset holdings. Several model specifications included similar relative measures of household consumption, using the survey's detailed consumption component.

transfers and the distinction between risk insurance and old age security motivations. Bangladesh's system of flood plain agriculture neatly divides land into low-lying tracts that are suitable for flood-plain agricultural production and higher elevation tracts that are largely suitable only for residential purposes.[12] In modeling a parent's capacity to offer migrant children short-term security, agricultural land, as a better predictor of income, is more suitable. In modeling a parent's capacity to provide old-age security, homestead land, which represents the minimum requirement for long-term rural settlement may be more suitable. More detailed information about the creation of absolute and relative asset and income variables, as well as correlation matrices, can be found in the appendix.

Data come from the portion of Matlab Thana covered by ICDDR,B's Demographic Surveillance System. In this area, ICDDR,B has conducted continuing demographic surveillance, with monthly records of every birth, death, marriage, divorce, and migration, since 1966. In 1996, a joint project led by RAND, ICDDR,B, University of Pennsylvania, and Mitra and Associates collected the Matlab Health and Socioeconomic Survey (MHSS), the first round of a large-scale panel survey of family life focusing on aging issues. The survey design and instrument, designed to support comparison to the Indonesian and Malaysian Family Life Surveys (IFLS and MFLS), sampled only within Matlab rather than all of Bangladesh in order to take advantage of the rich surveillance data for purposes of sampling, date correction, and historical data. Included among several purposively sampled modules is a two-stage random sample of one randomly sampled household in each of 2,997 *baris* (residential compounds). All statistical models are weighted to account for the greater representation of households from small *baris* in these data.

The analysis draws from Books I, II, and III of the MHSS. Book I provides basic demographic data on the rural respondent and data on the composition of the respondent's origin

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[12] Agricultural land, which lies at a slightly lower elevation, cannot be adjusted for residential purposes and is the only land that can be planted with most staple or cash crops. Homestead land cannot be used for flood cultivation because of its higher elevation, and its only use is for residences and orchards. While maximizing inheritance of agricultural land is desirable, possession of homestead land marks the minimum requirement for rural residence, particularly if migrant children provide support.

household. Book II provides all data on assets and income. Book III provides data on respondent characteristics and reports of non-householder children, including migrant sons. The Appendix provides more detailed information on the construction of variables as well as offering a table of means and standard deviations. The universe of the analysis is based on responses to Book III, which covered all respondents age 50 and older as well as their spouses. The analysis constructs respondent records that are actually couple-based. In order to avoid double-counting of transfers, married couples receive one observation based on the more comprehensive male reports of transfer receipt while individual male and female respondents receive their own records. All models include controls for presence of husband, wife, or both; husband and wife's age; and husband and wife's education (if one is not present, their value is reassigned to their gender-specific mean).

Included in Book III is a section (CH) asking the respondent a series of questions about any of his/her offspring that are not currently residing in the respondent's household. Data of this sort are unique to this group of family life surveys for collecting detailed data not only on children in the same household, but on children living elsewhere. Transfer data for the dependent variable are drawn from this section, as is the universe of observations for child-level models. The analysis employs data on all male children, age 15 or older, living outside Chandpur District. This section also contributes data on migrant destination area, years in destination, location of spouse, years of education, and age. Dependent variables are drawn from the question on total value of transfers received from the migrant in the past year. Although data are available on transfers from the respondent to the migrant, these are not utilized due to the uni-directional nature of transfer relationships with migrant sons.

The statistical analysis focuses on two types of statistical models: logistic regression models predicting the likelihood of any transfer (gross receipt greater than zero), and linear models predicting the value of transfers conditional on receipt of any transfer. For each variable specification presented in the text and the tables, results will be presented for both models, as in work using comparable data in other settings (Lillard and Willis 1997; Lillard et al. 2000). This combination of models is particularly compelling given the contextual and theoretical context of

intergenerational competition for security resources. While parents may receive small transfers from even economically and socially distant children, competition introduces the possibility that large transfers, the ones most likely to generate both parental support and migrant resource gains, may only flow to parents who offer substantial opportunity for investment. The theoretical expectation in this regard is that the model of transfer value, relative to the model of any transfer, should yield a somewhat stronger positive association with respondent assets relative to the negative association with respondent income.

Based on the theoretical foundations of the model, the use of a tobit specification is rejected. While such a model might otherwise be used for data of this sort, the constraint of having the same sign for coefficients in the censoring equation and the linear equation would not be appropriate. The second of the two equations, which models the conditional value of transfers, could be subject to endogenous selection, whereby the same reasons that lead children to migrate also lead them to make transfers, thus biasing the coefficients of the second model upwards. Tests of a Heckman two-stage regression, without an explicit identifiation variable, show no extreme violation of the assumptions of the model and result in only slightly reduced coefficients and standard errors. Since one of the primary motivations for conducting this analysis is to look at the how the determinants of the two equations differ, no selection corrections are used. The appendix includes the results of a simple linear model of the (unconditional) log of transfer value at the child-level, comparable to the models in Table 6. Many of the siblings tradeoffs presented in the results allow siblings to exchange transfer frequency for transfer value or trade transfer obligations in given years or given life stages, many of which are masked when the decision to make any transfer and the secondary decision to make a small transfer are joined together in one decontextualized model.

The analysis begins with parent- (or couple-) level models (one observation for each respondent). Logistic regression models predict the probability, p_t , of receiving any transfer in terms of respondent household structure (H), respondent (couple) characteristics (P), respondent household asset holdings and income (F), aggregate charcteristics of *i* non-sample non-householder children's characteristics (N_i) and aggregate characteristics of *j* migrant children (C_j

) using the following form:

$$\log\left(\frac{p(\sum v_j > 0)}{1 - p(\sum v_j > 0)}\right) = \beta_0 + \beta_1 H + \beta_2 P + \beta_3 F + \beta_4 N_{\bar{i}} + \beta_5 C_{\bar{j}} + \varepsilon$$

Conditional on receiving any transfer, two models of transfer value predict the natural log of the mean value of transfers from all migrant sons and the total combined value of their transfers, using the following equations:[13]

$$\log\left(\sum v_j \mid \sum v_j > 0\right) = \beta_0 + \beta_1 H + \beta_2 P + \beta_4 F + \beta_5 N_{\bar{i}} + \beta_6 C_{\bar{j}} + \varepsilon$$

$$\log\left(v_{\bar{j}} \mid \sum v_j > 0\right) = \beta_0 + \beta_1 H + \beta_2 P + \beta_4 F + \beta_5 N_{\bar{i}} + \beta_6 C_{\bar{j}} + \varepsilon$$

Child-level models predict a specific child's transfer behavior in terms of parent characteristics, the child's own characteristics, his migrant sibling-group's characteristics, and interactions with parent characteristics. Logistic models predict the likelihood that a respondent received money from a specific migrant son during the year:

$$\log\left(\frac{p(v_j > 0)}{1 - p(v_j > 0)}\right) = \beta_0 + \beta_1 H + \beta_2 P + \beta_3 F + \beta_4 N_{\bar{i}} + \beta_5 C_{\bar{j}} + \beta_6 C_j + \beta_7 C_j * F + \varepsilon$$

Conditional on any transfer from a given migrant son, linear models predict the log-value of the transfer received from that migrant:

$$\log\left(v_j \mid v_j > 0\right) = \beta_0 + \beta_1 H + \beta_2 P + \beta_3 F + \beta_4 N_{\bar{i}} + \beta_5 C_{\bar{j}} + \beta_6 C_j + + \beta_7 C_j * F\varepsilon$$

Parent-level models introduce the relationship between the respondent's household income, assets and migrant transfers. The models also include respondent demographic and household controls, including age, sex and information about the presence of locally-based children. Access to local children include separate measures for the number of unmarried and married sons living in the household, daughters living in the household, and sons and daughters living in other households in the same village. Subsequent respondent-level models add data on

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[13] Logged transfer values are used in this analysis because of the skewness of the data and the expectation of accelerating, non-linear investment returns to transfer value. For each variable specification appearing in the tables, analogous models of transfer value are tested using non-logged data. The results remain qualitatively similar, but (non-logged) logged models (under-) over-estimate asset effects at high transfer values.

the migrants themselves, with indicators of migrant educational attainment and migrant age averaged for all migrant children. Additionally, variables measure the number of children, number of sons living abroad, number of migrant sons currently enrolled in school, and number of migrant sons who are married and living in the destination area with their wives (hence referred to as "family migrants"). Table 2 measures migrant diversity at the parent level, showing total migrant sons, total family migrant sons, and total international migrant sons. Among a group having at least one migrant son, 44% have more than one migrant son. Another 10% have no other adult son, so about half of all parents having one migrant son have more than one. Over one-third of these respondents have an international migrant son, with about 10% having multiple sons abroad. Over half of the respondents have at least one son living permanently in the city.

Child-level models include measures of child-level variables, expressed in terms of a parent-level fixed component (the sibling mean for continuous variables, and any sibling for dichotomous variables) and a measure for the specific child. For migrant marital status and spouse location, here referred to as "conjugal status", initial specifications include a parent fixed indicator of whether any child was living in the city with his wife and a variable indicating whether the specific child was unmarried, married but living alone in the city (referred to as a "married individual migrant"), or a family migrant. Further specifications interact the fixed parent-level component with the specific child component in order to understand tradeoffs between siblings.

Table 3 divides respondent's children by own conjugal status and a measure of any family migrant brother. Because individual migration, particularly by currently married men, is a transient state that often quickly results in return migration or wife's migration, the percentage of married migrants living alone in the destination in this cross-sectional survey understates a man's lifetime rate of exposure to family migration. In spite of this, the sample provides enough diversity in terms of these two measures to effectively model differences between the groups as main effects and income interactions. The particularly small size of the group of married individual migrants with no family migrant brothers should give cause for concern about the

sensitivity of those results.

In addition to tables of regression models, the results include a graphical presentation of the complex joint-relationships of agricultural assets and income to both transfer probability and value. Based on these predictions, mean predicted values of both transfer measures are constructed for each of the 25 quntile combinations. These results are smoothed once in each direction, and presented in figures such as the hypothetical examples in Figure 3. Figures show the asset variable on the axis running along the right side of the graph, with values increasing as the graph goes away from the reader. Income is depicted on the axis along the front of the graph, with income increasing as values go to the right. Transfer measures are depicted on the vertical axis, with transfer likelihood or value increasing as values go upward on the graphs. It is also important to note the diagonal running from the front-left of the graph (low income, low assets) to the rear right (high income, high assets), referred to as the "profitability diagonal". All cases lying in the area of the graph to the left and behind the diagonal have relative income rankings that place them at or below their relative asset rankings, generating a situation of underperformance or deficit.

Generally, graphs that peak closer to the front left corner of the graph (low income, low assets) represents need-based behavior; graphs that peak towards the rear right represent self-interested behavior: Panel A depicts redistributive behavior, in which migrants are more likely to transfer when parental incomes are low and parents have no other source of support. Panel B depicts transfers that increase strictly with declining income. Panels C and D both result from a positive asset association, a negative income association, and an interaction between the two. In Panel C, a positive interaction generates a pattern of mutual self-interest, in which an income response is more likely to occur when assets are at the higher ends of the distribution. In Panel D, a negative interaction creates a pattern of greater action in areas of high income and low assets, suggesting that even respondents at the bottom of the asset distribution can expect increasing support with decreasing income. Panel E depicts transfers that increase strictly with rising parental assets. Panel F depicts an asset accumulation strategy, in which transfers are more likely when parental income and assets are both high.

V. Results

Parent-Level Analysis

The parent-level model includes main effects for the household's relative ranking (as a percentile) in terms of income, homestead value, and agricultural land value.[14] The use of relative income and asset measures minimizes the effect of outliers and adds a component of relative income, but little of the role of absolute land holdings is likely to be lost since the land distribution within the sample is not radically different from that of the rest of the country.[15] By using relative income and asset measures, income/asset interaction effects can be interpreted in terms of the respondent's relative household ranking for each variable, allowing the analysis to address specific motivations such as deficit reduction and mutual self-interest. [16] The parent-level model also includes child-level aggregrate variables (listed in the previous section) as well as a series of parent-level controls for demographic characteristics and housheold structure.[17]

Table 4 includes a term for relative household assets, relative agricultural assets, relative per capita income, and an interaction term for agricultural assets and income. This specification provided the most robust estimate of the effect of assets and income on both transfer measures, and it holds with theoretical expectation of significant interactions between income and assets that generate income. Homestead assets have a positive association with transfer probability and value, significant at the $p<0.05$ level, when no controls for migrant attributes are included (Model 1). With the addition of child-level controls, most importantly children's education, the

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[14] All households holding no agricultural assets (16%) are entered in the 8th percentile.

[15] While the discrete role of landlessness on transfer patterns will be lost, much of its role can be interpreted in subsequent quintile graphs of the role of agricultural land on transfers. Serendipitously, the 16% of respondents living in landless households will be well represented by results for the lowest quintile in these displays. While distributions may differ between relative and absolute measures, their effects on transfer patterns are similar.

[16] The use of relative income and asset measures eliminates the possibvility of out-of-sample predictions of the impact of changes in these variables, but such predictions are best reserved for future longitudinal analyses anyway.

[17] This model also includes controls for household structure, local family relationships, and respondent demographic characteristics. Household structure and local family relationships are reserved for another paper. Age and female gender had negative associations with transfer value but not transfer likelihood, which to some extent validates the presumption that transfer value better reflects child investment activity. Elderly and female respondents are less likely to conduct joint investment activities and may be more likely to alter the rules of inheritance if they are unhappy with a son. In order to confirm that these effects do not merely result from lower consumption by women and the elderly, additional models tested interactions between both effects and the homestead land effect. All of the age effect and most of the gender effect operated exclusively through a positive interaction with homestead land.

effects are reduced, but remain significant at the $p<0.10$ level. The role of homestead land, while still important, was acting to some extent as a proxy for parental investments.

The effect of agricultural assets on transfers, positive and significant for both transfer measures when not interacted with income (model shown in appendix), operates only through the pathway of an income interaction when an interaction term is included. Income ranking has a negative association with both measures of transfer behavior, significant at the $p<0.05$ level, but the introduction of the interaction term attenuates both effects at higher agricultural asset rankings. This interaction effect is larger than the income main effect in the transfer value model, while smaller in the transfer probability model, supporting the hypothesis of a larger role for land in the transfer value equation. Predictions of this three-way relationship, accounting both for coefficient estimates and the natural covariance of land and income in the sample, will be shown after presenting the results of child-level variables and in Figure 4.

Total number of children, shown in Model 2, is the most general indicator of potential sharing of support obligations between migrant children. Additional migrant children are associated with a greater probability of receiving any transfer and a great total conditional transfer value, but also a lower conditional value of transfers *per child*. Parents with more migrant children are able to receive a greater overall level of support even while children share obligations with siblings. This finding provides initial support for the presence of tradeoffs facilitated by size and diversity of a migrant sibling group.

Of great concern in validating the effect of assets and income on transfers are confounding effects of children's attributes that either may result from large parental assets or may substitute for forgone parental income, most significantly education and international migration. Average educational attainment of all children does have a strong effect on the likelihood of any transfer, but has no significant effect on either conditional total receipt or receipt per child. This combination of relationships, which suggests that the benefits of income at the mean only accrue through increased participation in transfer activity, may in itself mask a more complex set of tradeoffs between children that will be explored in the child-level models. Children's average age has no significant impact on their transfer behavior, but the value of

transfers does increase with a longer average time away from the respondent's household. If more children are attending school, the likelihood of receiving any transfer declines, but the conditional value of transfers shows no decline, suggesting either that students can provide income if necessary or that students typically have siblings who provide transfers on their behalf.

Indicators of migrant location and conjugal status are also expected to impact transfer receipts and tradeoffs between children. A greater number of international migrant children is not associated with a higher likelihood of any transfer, which is expected given that at least one migrant would be expected to send transfers from any location. They do have a strong positive association with the value of both total transfers and transfers per child. Each additional son having a wife living in the city does not impact the likelihood of any transfer or the average value of transfers, but does have an impact on parents' total transfer receipt if any transfer was recorded. This effect is robust to measures of parental age, children's age, and years in destination, suggesting a shift away from parental financial obligations after this life-transition. Each of these effects will also be explored in greater depth in child-level models.

The models in Table 4 suggest a robust two-way effect of income and agricultural assets on transfer probability and value, but the implications of these coefficients depend on both the coefficients themselves as well as the covariance relationship between the variables. While the table suggests that the role of an asset/income interaction is more crucial for transfer value, as predicted, the complex relationships between assets and income and transfers can best be shown graphically. Figure 4 shows the two-way effects of agricultural assets and income on transfer probability and total transfer value, applying predicted values based on the Model 2 specification with all other variables held at their mean.[18]

The graphs demonstrate the divergent role of significant asset/income interactions on the two measures of transfer behavior. While any transfer is generally more likely as income decreases and assets increase, both effects attenuate. The effects reach a plateau behind the

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[18] Figures depicting these relationships for the total value of transfers were not included owing to their comparability to average transfers per child. The per child results will also provide better comparability to child-level models presented below.

profitability diagonal, in the back left portion of the graph where the parent's household income ranking is lower than what would be expected based on assets. For assets that have a clear role in the income function, transfers serve a function of minimizing deficits and of providing some support either to parents with the greatest need (low assets and low income) or those who offer the greatest investment opportunity (high assets and high income). In contrast to the theoretical story of straight mutual benefit, in which the likelihood of transfers in response to low income would increase most when more assets required protection, transfer probability is better characterized by two simultaneous activities: providing necessary support and making well-placed investments.

The pattern of transfer value in Panel B sheds further light on this relationship by demonstrating a large gap between transfer values in the two areas of the graph in which transfer probabilities were high in Panel A. Transfer values are lowest when assets are low and incomes are high (as in Panel A). For low income / low asset respondents, one of the groups of highest transfer probability, predicted values are not the lowest, but they are lower than for any respondents in the highest asset quintiles. Transfers rise as assets increase, but is in fact the parents with both high assets and high income that receive the largest transfers. While this group receives transfers no more frequently than households in the greatest economic need, the predicted value of these transfers is 50% larger on the year. Additionally, transfer values are not highest when large assets are threatened by low incomes, as in the mutual benefit model, but when parents with large assets and surplus income are best placed to conduct high-profit investments that represent the best economic outcome for both parents and migrant children.

Child-level Models

Child-level can address the role of specific child characteristics on own transfer behavior as well as on tradeoffs resulting from siblings characteristics. They also afford better control over the potential confounding role of parental investments in mediating income/asset effects on transfer behavior. Models in Tables 5 and 6 retain respondent- and household-level variables from Models 1 and 2, while breaking child characteristics into two components: the parent-aggregated mean (or the number of children fitting a category for dichotomous variables), and

the specific child's measure (or his own status for a dichotomous variable).

It is important to begin by looking at a measure of the total number of migrants in Table 5, Model 3. There is no significant change in children's transfer probability with more migrant siblings, although a negative coefficient falls just short of significance at the $p<0.10$ level in all models. An increasing number of siblings does have a negative effect, significant at the $p<0.05$ level, on the value of a child's transfers during the year. While parents with multiple migrant children may benefit from year-to-year or life-course tradeoffs between children, the strength of the transfer value finding gives a more important role to tradeoffs in which all children continue to provide transfers, but benefit from dividing the total transfer obligation evenly among the children. The presence of this form of tradeoff may suggest a voluntary continuation of support throughout the life course. Qualitative research based in the same area also supports the notion that large families may be less able to practice life-course tradeoffs that allow sons to gear certain periods of the life course towards accumulation and others to parental support, as in the rest of this section (Kuhn 2001). In the absence of a long-term strategy involving quality-quantity tradeoffs and targeted investments in children, respondents may use the size of their families as a source of security, taking as much support from each as possible.

Child-level models offer further investigation of the role of children's educational tradeoff. While much of an education/transfer tradeoff would be expected to operate between migrant and non-migrant sons, there is also evidence here of an effect within a group of migrant siblings. The parent-level mean of sibling's education has no effect on the likelihood of any transfer, but a child's own education has a strong positive effect. Taken together, this suggests while children are repaying parental investments in education, but they are not necessarily replacing transfers from less educated siblings. A different pattern emerges for transfer value, however, where the significant positive effect for own educational attainment is balanced by a significant negative effect for mean children's education. While children may not trade their entire transfer obligations in any given year as a result of education, large transfers are more likely to come from the more educated siblings in a family, particularly when their siblings have lower educational attainment. Highly educated migrants compensate siblings who did not receive

the same opportunities by freeing them of the full scope of these obligations, yet less educated siblings can still be expected to make a small contribution.

The inclusion of measures for child's own education does not further diminish the power of assets and income in predicting transfer behavior in comparison to parent-level models, offering at least some evidence that these effects do not merely proxy for parental investments in children. Model 4 in Table 5 addresses these issues further by including interactions between the four income/asset measures and child's own educational attainment. In the model of transfer probability, the significant positive interaction effect between educational attainment and homestead asset value eliminates the role of a main effect for homestead value. This finding, not suggestive of current homestead value being a mere proxy for the role of parental investment capacity, must convey a more complex set of linkages most likely resulting from serial auto-correlation of transfers from highly educated children. If homestead assets are large because highly educated children's past transfers have allowed accumulation of those assets, then the current homestead effect might be expected to hold only for those children who have a continuing capacity to make transfers. If this post-hoc justification is an appropriate explanation for the homestead/education interaction effect, then the insignificant role of agricultural asset / education interactions on transfer probability suggests that the role of agricultural assets is robust, and not merely a result past investment of transfers on agricultural land.

Income/education interaction terms can be used to test whether the negative income/transfer response results from children's efforts to support parents in need or merely from a repayment of past parental investments that favored children's labor market income over agricultural income. The transfer probability model shows no significant income/education interaction effect, nor did alternate specifications in which interactions terms were removed to isolate only the role of income. The transfer value model, on the other hand, shows that better educated children actually send smaller transfers to low-income parents than less educated ones. This model specification, which still controls for siblings' education, suggests that the income/transfer association is not a proxy for anticipated parental income deficits; in fact it appears that better educated children appear to send larger transfers to their high-income parents.

Child-level measures of school enrollment demonstrate a form of inter-sibling life-course cooperation. Children currently enrolled in school are less likely to make transfers than other migrants. While the value of transfers sent by students is no lower than average (since the true effect equals the own-effect plus the siblings effect), transfers from their siblings are significantly larger than average. Since some son has to provide support at any given time, the brothers of migrants enrolled in school are not likely to be sending more frequent transfers than other migrants at similar life stages, but they are likely to use larger transfers both to compensate for the temporary loss of transfers from a son focusing on human capital advancement and to finance a siblings' higher education through a parental conduit.

Children's international migration, often funded by parental investments, offers another source of income diversity for parents and siblings. The tradeoff is demonstrated in the results, where the likelihood of any transfer from an international migrant (own effect + sibling-group effect) is always higher than that of his siblings (sibling-group effect alone), who have the lowest transfer probability of any group. The likelihood of any transfer by an international migrant himself may drop below that of a migrant from a family with no international migrants (no own- or group- effect) since each additional international migrant reduces others' obligations. Transfer value from international migrants is much higher than average, reflecting its role as a more substantial source of capital than other forms of migration. While domestic migrants send smaller transfers send less than their international migrant brothers, they do not send less than migrants from families having no international migrants. This also reflects a diversity tradeoff in which international migrants, a dominant source of support, are more likely to make any transfer, but if a crisis in the destination area prevents them from making transfers, then their domestic migrant siblings will be asked to provide at least as much as any other domestic migrant would.

In addition to the spatial diversity afforded by international and internal migration, the theoretical framework suggests that life-course diversity would offer households with long planning horizons the opportunity to have migrant sons play different roles over the life course. These results form the focus of the remainder of the results. Model 4 offers basic support of this hypothesis, suggesting that family migrants (own-effect + sibling-group effect), while making

transfers with no less frequency than their other migrants siblings, are likely to make much smaller transfers than their other migrant siblings (sibling-group effect alone). Their transfers are not significantly smaller than transfers by migrants from siblings groups with no family migrants at all (no own- or group-effect).

Model 5 in Table 6 pursues this finding further, in order to look more deeply at tradeoffs between family and individual migrants, as well as to further break individual migrants into those who are already married and those have not yet married.[19] The results suggest a role of conjugal status / life stage in the likelihood of transfer as well. Married individual migrants, who have obligations not only to parents but also to their spouses and children, are significantly more likely to make any transfer than their unmarried siblings or their family migrant siblings. This effect is strong whether a family migrant brother is available or not. Transfer value, as in the previous model, depends both on own life stage and on the availability of a family migrant sibling. While unmarried and married individual migrants make similar sized transfers when they have no brother in the city, both groups make larger transfers when they have a family migrant brother, particularly the married individual migrants. Given the continued significance of the coefficient for total number of migrants in the sibling-group, this suggests that individual migrants send larger transfers either when they are the only migrant sibling or when they have a sibling who has moved away from certain support obligations.[20]

While these results suggest that family migrants make smaller transfers than other groups and fewer transfers than their married brothers who live alone in the city, they do not address the continuing role of family migrant transfers. While qualitative research on these same issues suggests that family migrants usually reduce their overall level of parental support, it also suggests that the extent to which support is truly reduced often depends on parental needs (Kuhn

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[19] The model also includes a small category for married individual migrants whose wives don't live with the migrants parents. These women may live with their own parents, in another migrant destination, or their may be misreporting. The categorical variable has not significant effect on either measure of transfer behavior.

[20] An exhaustive series of models tested potential three-way interaction effects between total number of siblings, own conjugal status, and siblings' conjugal status as well as their interactions with income. In no specification did the coefficients resulting from this detailed model differ from a model where number of siblings and conjugal status were treated additively.

2001); family migrants may reduce their level of regular support but provide crucial support in cases of medical or family emergency. Model 6 shows the role of interactions between parental income ranking and conjugal status, demonstrating a more complex relationship between family migration and financial transfers. Main effects for own and siblings' conjugal status are accompanied by interactions between parental income ranking and two own status variables (married individual migrant, unmarried migrant, with family migrant as the reference category) and one measure of whether any member of the sibling group was a family migrant. These interactions, all three strongly significant, suggest that the basic negative association between income and likelihood of any transfer is dampened for all three groups. Taken together, the income response is strongest among individual migrants who have no family migrant siblings (all coefficients equal zero) and weakest among individual migrants who do have a family migrant brother (one of each coefficient equals one), with family migrants themselves occupying a middle ground (only family migrant coefficient equals one). The models show no significant interaction effects for transfer value.

The interactions in Model 6 are difficult to interpret, and merit a summary of predicted effects and further use of the three-way graphs employed in Figure 3. Table 7 shows predicted transfer probabilities and values, based on the Model 6 specification, in terms of total number of migrant siblings, own conjugal status, and family migrant siblings. Married individual migrants' transfer probability is universally higher than that of other migrants, but access to alternate migrant siblings generates slight declines in transfer probability and large declines in transfer values (from 62% and 5,600 taka with only individual migrant siblings, to 67% and 7,100 taka with no migrant siblings at all, to 72% and 21,000 taka with family migrant siblings). Unmarried migrants, who have no rural spousal obligations and are more likely to be in a stage of capital accumulation, send transfers no more frequently than family migrants, but these transfers are often quite large. While they are less likely to adjust their transfer obligations to the availability of other migrant siblings than married individual migrants, there is some suggestion of tradeoff, with increasing transfer probabilities when they are the only migrant available, and increasing transfer values when one migrant sibling is a family migrant. Family migrant transfers are

smaller and less frequent than those of any other type of migrant when they are the sole migrant son. Their transfers are also smaller and less frequent than those of their own married individual migrant siblings and somewhat smaller than those of their unmarried migrant siblings.

While these results suggest a much smaller transfer role for family migrants, they do suggest a continued role. Income interationcs also suggest that their transfers can be better geared towards parental need. Figures 4, 5 and 6 demonstrate the complex role of family migrant transfers by presenting predicted curves of the relationship between respondent agricultural assets, income and transfers, first for family migrants (Figure 4), then for married individiual migrants (Figure 5), and then for unmarried migrants (Figure 6).

Figure 4 shows the primary role of parental income in determining the likelihood of any transfer from family migrant sons. Any transfer is highly unlikely for parents in the wealthiest quintile, but this probability rises to over 50% in the bottom income quintile, regardless of agricultural holdings. The conditional value of transfers from family migrants does increase for both lower income and higher assets. Even family migrants may see some purpose in protecting assets where they need protection, either for their own sake or to maintain a family inheritance, but the primary force driving their transfers is parental need.

Figure 5 shows how the transfer patterns of married individual migrants, while universally high, can be influenced by the freedom provided by a family migrant sibling. Panel A shows that married individual migrants' transfer probability rarely drops below the highest expected transfer probability for their family migrant brothers. The strong pattern of asset response and *positive income response* in the sending of any transfer, however, means that while they are far more likely than their family migrant brothers to make transfers to parents who have high incomes, they are slightly more likely to do so for parents with low incomes and low assets. The negative income/transfer value relationship in Panel D results from a strongly insignificant interaction term, and is placed in the figure largely to demonstrate the overall level of transfer value. Even though married individual migrants have a set of strong obligations to make urban-rural transfers, the presence of a more established family migrant brother can allow them to forgo some of those obligations when parental assets are low, presumably in an effort to accumulate

urban business or human capital. More frequent transfers are only sent when the rural household also represents a possible site of profitable investment, with extensive land and income that wold facilitate asset accumulation through lending in the informal credit market.

When no family migrant sibling is available (Panels C and D), the pattern of any transfer shifts towards an income response in which income, low asset parents over twice as likely to receive any transfer as high income, low asset families. In essence, the married individual migrant has taken up the role that the family migrant brother had played for the migrant in Panel A. Transfer values from this group, which largely respond to income as well, are far lower on average (and particularly at their peak) than they are in Panel B. While this may suggest some form of selectivity whereby brothers of family migrants (who often have high incomes) are more likely to have high incomes themselves, it may suggest other forms of smoothing. One possibility suggests that the freedom of having family migrant brothers may have both facilitated access to and adoption of more exceptional opportunities for urban capital accumulation, allowing higher salaries for these migrants. Another suggests that sons who bear the sole burden of parental support, knowing that they have no brothers to offer a hedge against their own crises or future parental support obligations, may retain some of their surplus income personally.

The role of family migrants in the transfer patterns of their unmarried migrant brothers is even more extreme (Figure 6). Unmarried migrants' transfer probability and value actually rises with *increasing* income and assets when a family migrant brother is available, suggesting that they are likely to make transfers when the respondent's rural holdings represent the best possible investment for surplus income, while choosing to focus on some other form of capital accumulation in other instances. When no family migrant brother is available, transfer probability shifts to the familiar pattern of strong income and asset response, albeit at a lower overall level than for married individual migrants. Conditional transfer value is still highest when assets and income are high, suggesting a merging of motivations. Unmarried migrants with no family migrant brothers provide need-based support because they are the only option, and in the process they may move more quickly to align their own investments with their parents' assets. They may also continue to look toward alternate urban investment options by retaining

some of their income or making milder urban investments.

VI. Discussion and Conclusion

The primary concern of this paper is in testing the strength of financial support mechanisms for parents of out-migrants in Bangladesh, a country undergoing rapid shifts towards smaller families, fewer rural resources, and increased migration. In any security relationship where there is strong past evidence of mutual benefit, the continuation of support may be dependent on the maintenance of reciprocity and the number and diversity of support partners. While these are all relevant concerns, and it is difficult to predict the future, this cross-sectional analysis of one of the most important migrant-sending areas of the country suggests that financial transfers from migrant children are common, frequently need-responsive, and adaptable to a variety of family structures.

The analysis shows that on average, the sending of any migrant-parent transfer can often respond to low parental incomes, particularly when parental wealth is also low, or to high parental assets. Transfers to low-income respondents do not appear to reflect the repayment of any income forgone in investing in children's income. Rather than suggesting the hypothesized pattern of enlightened self-interest, where transfers are most likely when low parental incomes threaten large parental assets, the pattern for any transfer can best be characterized as a deficit reduction strategy in which transfers reach high and relatively invariant levels if a parent's household income ranking is equal to or below its asset ranking. While some amount of support is available to parents during periods of need, even when they have little to offer children in return, large transfers, as indicated by a conditional model of transfer value, are likely to occur only when parental asset level are high. This suggests that, at least in the current period, migrant children are effectively able to provide moderate levels of parental support, particularly during periods of need, even while pursuing alternate investment strategies such as urban land, businesses, and securities.

Parent-level transfer patterns mask a more complex set of strategies undertaken by specific migrant children. Family migrants continue to provide limited amounts of need-based support to parents in spite of shifting their production, consumption, and security activities to the

city. For other migrants, the availability of an established family migrant brother facilitates a strategy in which large transfers are sent during periods of parental accumulation and investment, while alternate urban accumulation strategies are pursued at other times. The results provide strong evidence of the flexibility of the Bangladeshi family system to continue providing support for the elderly in spite of limited rural assets, limited urban incomes, and limited alternatives for support.

While these results show that exclusive concern over a crisis for the elderly would be misplaced, a more complex set of long-term concerns are raised by the results and by what does not appear in the results. First, to the extent that children will attempt to maintain a constant level of parental support under any transitional economic or demographic regime, aging damages the economic fortunes of children themselves rather than their parents. While reduced flexibility of migrant support alternatives does not reduce the overall level of parental support, it does appear to increase individual sons' obligations as well as constrain efficient allocation of investments by forcing them to consolidate security relationships with parents. This micro-level result mirrors the impact of increasing old-age dependency ratios on the finances of unfunded pension systems in the developed world.

The results also raise a concern about second-generation effects of financial flows in the current old-age support system. By sending only subsistence-level transfers to asset-poor parents, migrants must accept the potential liquidation of parental lands and must draw support exclusively from strictly urban sources of informal security. Their non-migrant siblings are also likely to lose land in these circumstances, yet will not have the benefit of urban income. The analysis suggests that a group of households with high assets, high surplus income, and multiple out-migrants to domestic and international destinations have the resources and flexibility to accumulate the assets of households whose migrants have divested of their rural resources. Even as migration slows the decline of mean *rural* assets by slowing population growth, it can speed up the decline of the *median* by accelerating polarization. Access to future rounds of the same survey will permit fixed effects modeling of the impact of changing parental assets and parent-child relationships on transfer receipt.

One issue not well addressed by the analysis is activity at the tails of the transfer distribution. While it appears that the family can persist as a source of support even in periods of intense demographic and economic pressure, the likelihood of transfers are not universal for any group and many transfers are so small as to only be effective when combined with liquidation of assets, continued labor market activity, support from sons still living in the village, and support from daughters before and after marriage. Qualitative analysis suggests that elderly support and security formation in Bangladesh involve an increasingly complex and extensive combination of formal and informal sources. These are best represented by the rapid growth in women's labor migration, but many others exist as well. Declining family sizes introduce not only a smaller number of immediate sources of support, but also a proportionate contraction in the overall complexity of a social support network. With declining mortality comes a longer period of old-age morbidity in which elderly labor market participation may no longer be possible. The next two generations of population momentum offer reason to fear leakage or collapse in a system that thrives on diversity of informal support options.

Taking these broader concerns into account, this research must be placed into a larger framework of research on access not only to elderly financial support, but also to elderly support and care. Research linking elderly financial and personal support to longitudinal data on health, psychological well-being and mortality will model the effectiveness of familial support mechanisms. Given the vertical nature of elderly support mechanisms and even greater concern about aging in the next generation, this research must be broadened to a perspective on life-course security formation. As strictly urban security mechanisms replace urban-rural security mechanisms and urban settlement rates increase, research must focus on support of the urban elderly, incorporating analysis of urban informal security mechanisms such as slum residence and informal labor market activity.

It is also important to note that this research takes place in Matlab, an area where proximity to urban areas and high levels of international migrant social capital drastically reduce the costs of individual migration, frequent urban-rural social contact and urban-rural economic cooperation. Given this unique context, the elderly of other areas of Bangladesh are less likely to

have children with access to urban earnings opportunities, less likely to receive personal support from migrants and their wives, and far more uncertain about financial transfers from migrant children. While Matlab is an ideal place to study these issues because of the strength of migration flows and high rates of transfer, future research should study elderly security formation in other rural areas.

Bibliography

Afsar, Rita (1994). Internal Migration and Women: An Insight into Causes, Consequences, and Policy Implications. *The Bangladesh Development Studies* 2 & 3: 217-243.

Bangladesh Bureau of Statistics (1995). *Bangladesh Statistical Yearbook.* Dhaka, Bangladesh.

Becker, Gary S. (1991). *A Treatise on The Family,* Enlarged Edition. Cambridge,MA: Harvard Univerity Press.

Becker, Gary S. and N. Tomes (1976). "Child Endowments and the Quantity and Quality of Children." *Journal of Political Economy* 84:S142-163.

Caldwell, John C. (1976). "Toward a Restatement of Demographic Transition Theory". *Population and Development Review* 2:321-366.

Chen, Lincoln C., A.K.M. Alauddin Chowdhury, and Sandra L. Huffman (1979). Seasonal Dimensions of Energy Protein Malnutrition in Rural Bangladesh: The Role of Agriculture, Dietary Practices, and Infection. *Ecology of Food and Nutrition*, 8: 175-187.

Durand, Jorge, William Kandel, Emilio A. Parrado, and Douglas S. Massey (1996, May). "International Migration and Development in Mexican Communities". *Demography* 33(2):249-64.

Frankenberg, Elizabeth and Randall Kuhn (2001). "Old-Age Support from Sons and Daughters: Bangladesh and Indonesia in Comparison". Presented at Population Association of America Meetings, March 2001: Washington, DC.

Greenhalgh, Susan (1985). "Families and Networks in Taiwan's Economic Development". In Edwin Winckler and Susan Greenhalgh (eds.) *Contending Approaches to the Political Economy of Taiwan.* New York: Armonk.

Jahangir, Borhanuddin Khan (1979). *Differentiation Polarization and Confrontation in Rural Bangladesh.* Center for Social Studies, University of Dhaka.

de Janvry, Alain and Carlos Garramon (1977). "The Dynamics of Rural Poverty in Latin America". *Journal of Peasant Studies* 5(2):206-216.

Jensen, Eirik G. (1987). *Rural Bangladesh: Competition for Scarce Resources.* Dhaka, Bangladesh: University Press Limited.

Kuhn, Randall (1999). *The Logic of Letting Go: Family and Individual Migration from Rural Bangladesh".* Unpublished Doctoral Dissertation, University of Pennsylvania, Graduate Group in Demography.

Kuhn, Randall (2000). "The Logic of Letting Go: Family and Individual Migration from Rural Bangladesh". RAND Labor and Population Working Papers 2000-09.

Kuhn, Randall (2001). "The Impact of Nuclear Family and Individual Migration on the Elderly in Rural Bangladesh: A Qualitative Analysis". RAND Labor and Population Program Working Papers.

Lee, Yean Ju, William Parish and Robert Willis (1994). "Sons, Daughters, and Inter-Generational Support in Taiwan". *American Journal of Sociology* 99(4):1010-1041.

Lillard, Lee A. and Robert J. Willis (1994). "Intergenerational Educational Mobility: Effects of Family and State in Malaysia". *Journal of Human Resources* 29:1126-1167.

Lillard, Lee A. and Robert J. Willis (1997a). "Motives for Intergenerational Transfers: Evidence from Malaysia". *Demography* 34(1):115-134.

Lillard, Lee, Robert Willis and Elizabeth Frankenberg (2000). "Money for Nothing? Altruism, Exchange, and Old Age Security in Southeast Asia". Unpublished paper, RAND.

Lopes, Lola L. (1994). "Psychology and Economics: Perspectives on Risk, Cooperation and The Marketplace". *Annual Review of Psychology* 45:197-227.

Lucas, Robert E B. and Oded Stark (1985, October). Motivations to Remit: Evidence from Botswana. *Journal of Political Economy* 93:901-18.

Massey, Douglas S., Joaquín Arango, Graeme Hugo, Ali Kouaouci, Adela Pellegrino, and J. Edward Taylor (1999). *Worlds in Motion: Understanding International Migration at The End of The Millennium.* New York: Oxford University Press.

Mitra, S.N., M. Nawab Ali, Shahidul Islam, Anne R. Cross, and Tulshi Saha (1994). *Bangladesh Demographic and Health Survey: 1993-1994.* Washington, DC and Dhaka, Bangladesh.

Mostafa, Golam, M.A. Kashem Shaikh, Jeroen K. van Ginneken and A.M. Sarder (1998). *Demographic Surveillance System – Matlab: Registration of Demographic Events 1996.* Scientific Report No. 82, International Centre for Diarrhoeal Disease Research, Bangladesh.

Oberai, A.S. and M.H.K. Singh (1980). "Migration, Remittances and Rural Development: Findings of a Case Study in the Indian Punjab". *International Labor Review* 119(2):229-241.

Portes, Alejandro and John Walton (1981). *Labor, Class, and the International System*. New York. Academic Press.

Rempel, Henry and Richard A. Lobdell (1978). "The Role of Urban-to-Rural Remittances in Rural Development". *Journal of Development Studies* 14(3):324-341.

Shaw, Annapurna (1988, January). "The Income Security Function of the Rural Sector: The Case of Calcutta, India". *Economic Development and Cultural Change* 36:303-14.

Stark, Oded (1982). Research on Rural-to-Urban Migration in LDCs: The Confusion Frontier and Why We Should Pause to Rethink Afresh. *World Development* 10(1):63-70.

Stark, Oded (1991). *The Migration of Labor*. Cambridge, MA: Basil Blackwell.

Stark, Oded (1995). *Altruism and Beyond: An Economic Analysis of Transfers and Exchanges in Families and Groups*. Cambridge, UK: Cambridge University Press.

Stark, Oded and David E. Bloom (1985). The New Economics of Labor Migration. *American Economic Review* 75:173-178.

Taylor, J. Edward and T. J. Wyatt (1996). The Shadow Value of Migrant Remittances, Income and Inequality in a Household-farm Economy. *The Journal of Development Studies* 32(6):899-912.

United Nations (1995). *The Challenge of Urbanization: The World's Largest Cities*. New York: United Nations Secretariat, Department of Economic and Social Affairs, Population Division.

United Nations (1996). *World Urbanization Prospects: The 1996 Revision*. New York: United Nations Secretariat, Department of Economic and Social Affairs, Population Division.

Willis, Robert (1982). "The Direction of Intergenerational Transfers and Demographic Transition". *Population and Development Review* 8(3): 207-234.

Table 1: Respondent Transfer Income, Total Sample of Respondents

	Number	Income In	Income Out	Income Net	Number	Income In	Income Out	Income Net
Parents	?	24	61	(37)	?	23	3	20
Siblings	3.74	783	127	657	3.71	838	90	748
Other Family		284	237	47		439	286	153
Friends		14	187	(173)		13	295	(282)
Workplace		0	13	(13)		0	0	0
Institutions		13	21	(8)		21	24	(3)
Neighboring Daughters	0.26	46	27	19	0.23	38	20	18
Daughters in District	1.06	259	185	75	1.00	450	228	222
Daughters outside District	0.59	246	62	184	0.63	222	92	130
Daughters abroad	0.03	49	2	47	0.03	28	3	25
Neighboring Sons	0.34	171	9	162	0.24	263	7	256
Sons Elsewhere in District	0.11	64	64	0	0.10	51	94	(43)
Sons outside District (A)	0.62	1,781	270	1,511	1.18	3,372	511	2,861
Sons abroad (B)	0.26	6,496	567	5,928	0.50	12,299	1,074	11,225
Total from Children (C)	3.28	9,111	1,186	7,926	3.90	16,723	2,030	14,693
Total Transfers (D)		10,230	1,832	8,399		18,057	2,727	15,330
Agricultural Income (E)				7,056				7,904
Non-Agricultural Income (F)				23,133				20,368
Total Income + Transfers (D + E + F = G)				38,588				43,602
Total from Migrant Sons	0.88	8,277	837	7,439	1.68	15,671	1,585	14,086
As % of All Children's	26.8%	90.8%	70.6%	93.9%	43.1%	93.7%	78.1%	95.9%
As % of All		80.9%	45.7%	88.6%		86.8%	58.1%	91.9%
As % of Total Income				19.3%				32.3%
N				1,509				797

Source: MHSS Book 3 Non-Householder Relationship Modules, all couples age 50+

Table 2: Parent-Level Distribution of Migrant Children

	Total Children of This Type				
	0	1	2	3	4+
Migrant Sons	0.0%	56.4%	28.0%	9.7%	5.9%
International Migrant Sons	63.1%	27.3%	7.2%	2.1%	0.3%
Family Migrant Sons	47.9%	37.8%	9.5%	3.7%	1.0%

Total Observations = 792

Table 3: Child-Level Distribution of Own and Brothers' Conjugal Status

Sibling Status	Own Conjugal Status		
	Family Migrant	Married Individual Migrant	Unmarried Individual
Family Migrants = 0		14.80%	26.60%
Family Migrants = 1	43.50%	4.20%	11.00%

Total Observations =1,323

Table 4: Parent-Level Transfer Models

	Model 1			Model 2		
	(1)	(2)	(3)	(1)	(2)	(3)
	Any Transfer	Average Transfer Value	Total Transfer Value	Any Transfer	Average Transfer Value	Total Transfer Value
Household Homestead Value Percentile	1.104**	1.044**	1.059**	0.814*	0.690*	0.654*
	(0.435)	(0.355)	(0.365)	(0.454)	(0.361)	(0.366)
Household Agricultural Value Percentile	-0.106	-0.444	-0.263	-0.476	-0.322	-0.300
	(0.713)	(0.514)	(0.547)	(0.715)	(0.489)	(0.492)
Household Income per Capita Percentile	-2.142**	-3.084**	-3.316**	-2.086**	-2.725**	-2.737**
	(0.657)	(0.542)	(0.560)	(0.664)	(0.519)	(0.518)
Agricultural Land Percentile*Income Percentile	1.827	4.139**	4.076**	2.045*	3.544**	3.528**
	(1.189)	(0.950)	(1.009)	(1.171)	(0.912)	(0.914)
Children's Average Education				0.086**	-0.011	-0.009
				(0.030)	(0.026)	(0.026)
Children's Average Age				-0.007	0.002	0.004
				(0.019)	(0.016)	(0.017)
Children's Average Time Away				0.002	0.004*	0.004*
				(0.003)	(0.002)	(0.002)
Total Number of Children in Sample				0.340**	-0.252**	0.269**
				(0.173)	(0.124)	(0.122)
Number of Family Migrant Children				-0.200	-0.205*	-0.233*
				(0.170)	(0.122)	(0.122)
Number of International Migrant				-0.060	0.659**	0.651**
				(0.186)	(0.131)	(0.133)
Number of Migrant Children Enrolled in School				-1.028**	0.400	0.395
				(0.363)	(0.340)	(0.361)
Constant	-1.098	10.774**	10.980**	-1.751	10.068**	9.720**
	(1.343)	(1.118)	(1.309)	(1.449)	(1.054)	(1.053)
Observations	792	451	451	792	451	451
R-squared	0.08	0.32	0.32	0.11	0.43	0.44
Wald Chi-Square	43.1	13.3	14.5	60.9	14.8	15.2

Robust standard errors in parentheses
*significant at 10%; **significant at 5%

Table 5: Child-Level Transfer Models

	Model 3		Model 4	
	(1)	(2)	(1)	(2)
	Any Transfer	Transfer Value	Any Transfer	Transfer Value
Household Homestead Value Percentile	0.854**	0.485	-0.129	0.531
	(0.364)	(0.344)	(0.645)	(0.728)
Household Agricultural Value Percentile	-0.430	-0.577	0.247	-0.690
	(0.516)	(0.360)	(0.951)	(0.782)
Household Income per Capita Percentile	-2.014**	-2.642**	-1.816**	-4.011**
	(0.558)	(0.473)	(0.823)	(0.729)
Agricultural Land Percentile * Income Percentile	2.181**	3.580**	1.839	5.783**
	(0.917)	(0.794)	(1.659)	(1.491)
Sibling Mean Education	-0.003	-0.075**	0.003	-0.081**
	(0.050)	(0.037)	(0.051)	(0.036)
Child's Own Education	0.075*	0.076**	0.062	0.062
	(0.043)	(0.033)	(0.070)	(0.050)
Sibling Mean Age	-0.046	-0.002	-0.044	-0.003
	(0.031)	(0.024)	(0.031)	(0.023)
Child's Own Age	0.053*	-0.011	0.051*	-0.009
	(0.027)	(0.021)	(0.027)	(0.021)
Sibling Mean Years in Destination	0.000	0.003	0.000	0.003
	(0.003)	(0.002)	(0.003)	(0.002)
Child's Own Years in Destination	0.014	0.014	0.013	0.016
	(0.013)	(0.013)	(0.013)	(0.013)
Total Number of Children in Sample	-0.148	-0.223**	-0.144	-0.243**
	(0.092)	(0.088)	(0.093)	(0.084)
Child is Family Migrant	-0.027	-0.957**	-0.009	-0.979**
	(0.299)	(0.240)	(0.297)	(0.246)
Any Sibling in Family is Family Migrant	-0.362	0.696**	-0.386	0.756**
	(0.307)	(0.222)	(0.306)	(0.223)
Child is International Migrant	0.740**	1.013**	0.776**	0.993**
	(0.286)	(0.301)	(0.289)	(0.304)
Number of International Migrant Children	-0.408**	0.175	-0.421**	0.200
	(0.157)	(0.136)	(0.159)	(0.136)
Child is in School	-2.140**	-0.825	-2.197**	-0.764
	(0.793)	(0.742)	(0.797)	(0.713)
Total Number of Siblings in School	-0.181	0.889**	-0.138	0.888**
	(0.358)	(0.259)	(0.352)	(0.267)
Own Education * Homestead Percentile			0.136*	-0.015
			(0.075)	(0.080)
Own Education * Agriculutral Percentile			-0.102	0.020
			(0.117)	(0.086)
Own Education * Income			-0.045	0.217**
			(0.116)	(0.110)
Own Education * Income * Agricultural Percentile			0.071	-0.317
			(0.199)	(0.202)
Constant	-1.197	9.725**	-1.202	9.832**
	(1.085)	(0.910)	(1.148)	(0.885)
Observations	1323	624	1323	624
R-squared	0.12	0.49	0.12	0.5
Wald Chi-Square	108.9	17.8	118.4	18.5

Robust standard errors in parentheses
*significant at 10%; **significant at 5%

Table 6: Child-Level Models: Detailed Conjugal Status Specifications

	Model 5		Model 6	
	(1)	(2)	(1)	(2)
	Any Transfer	Transfer Value	Any Transfer	Transfer Value
Household Homestead Value Percentile	0.837**	0.490	0.181	0.694*
	(0.365)	(0.345)	(0.408)	(0.395)
Household Agricultural Value Percentile	-0.676	-0.628*	-0.379	-0.643*
	(0.530)	(0.352)	(0.547)	(0.357)
Household Income per Capita Percentile	-2.040**	-2.646**	-4.910**	-2.863**
	(0.566)	(0.480)	(1.126)	(0.812)
Agricultural Land Percentile * Income Percentile	2.478**	3.672**	2.067**	3.629**
	(0.943)	(0.806)	(0.952)	(0.819)
Total Number of Children in Sample	-0.150	-0.210**	-0.203**	-0.200**
	(0.092)	(0.088)	(0.090)	(0.086)
Family Migrant	---		---	
Unmarried Migrant, Family Migrant Brothers = 0	0.004	0.206	-0.240	-0.096
	(0.277)	(0.203)	(0.433)	(0.322)
Married Migrant, Wife with Parents, Family Migrant Brothers = 0	0.870**	0.173	0.783	0.364
	(0.290)	(0.240)	(0.500)	(0.334)
Unmarried Migrant, Family Migrant Brothers >= 1	-0.326	0.552**	-1.712**	0.182
	(0.358)	(0.269)	(0.546)	(0.390)
Married Individual Migrant, Wife with Parents, Family Migrant Brothers >= 1	1.177**	1.560**	0.284	1.757**
	(0.542)	(0.367)	(0.679)	(0.495)
Married Individual Migrant, Wife's Location Unknown	-0.101	-0.338	-0.230	-0.197
	(0.339)	(0.395)	(0.357)	(0.383)
Family Migrant Siblings >=1 * Parent's Income Percentile			2.557**	0.136
			(0.914)	(0.640)
Unmarried Migrant * Parent's Income Percentile			3.010**	0.668
			(0.877)	(0.671)
Married Individual Migrant (wife with parents) * Parent's Income Percentile			2.457**	-0.474
			(1.209)	(0.888)
Constant	-1.212	9.761**	-0.933	9.857**
	(1.135)	(0.989)	(1.107)	(0.968)
Observations	1323	624	1323	624
R-squared	0.13	0.49	0.16	0.5
Wald Chi-square	120.7	16.6	146.1	15.7

Robust standard errors in parentheses

*significant at 10%; **significant at 5%

Table 7: Predicted Child-Level Transfer Probabilities and Values by Own and Siblings' Conjjugal Status, Number of Sons

	Migrant Sons = 1			Migrant Sons > 1			All Sons		
Conjugal Status Group	Transfer Prob.	Transfer Value (Tk)	Total = Value * Prob	Transfer Prob.	Transfer Value (Tk)	Total = Value * Prob	Transfer Prob.	Transfer Value (Tk)	Total = Value * Prob
Family Migrant	43.7%	5,507	2,407	40.4%	4,479	1,810	41.5%	4,807	1,995
Married Individual Migrant, Family Migrant Brothers > 0	n/a	n/a	n/a	72.3%	21,046	15,216	72.3%	21,046	15,216
Married Individual Migrant, Family Migrant Brothers = 0	66.7%	7,089	4,728	62.3%	5,629	3,507	64.3%	6,301	4,052
Unmarried Migrant, Family Migrant Brothers > 0	n/a	n/a	n/a	34.3%	8,081	2,772	34.3%	8,081	2,772
Unmarried Migrant, Family Migrant Brothers 0	47.1%	7,041	3,316	42.6%	6,240	2,658	44.8%	6,680	2,993
All Migrants Combined	48.5%	6,433	3,120	43.0%	6,372	2,740	44.9%	6,394	2,871

Figure 1: Population of Matlab Surveillance Area (1982-1996):
Alternate Estimates Adjusted for 1st Round Effects of Net Out-Migration

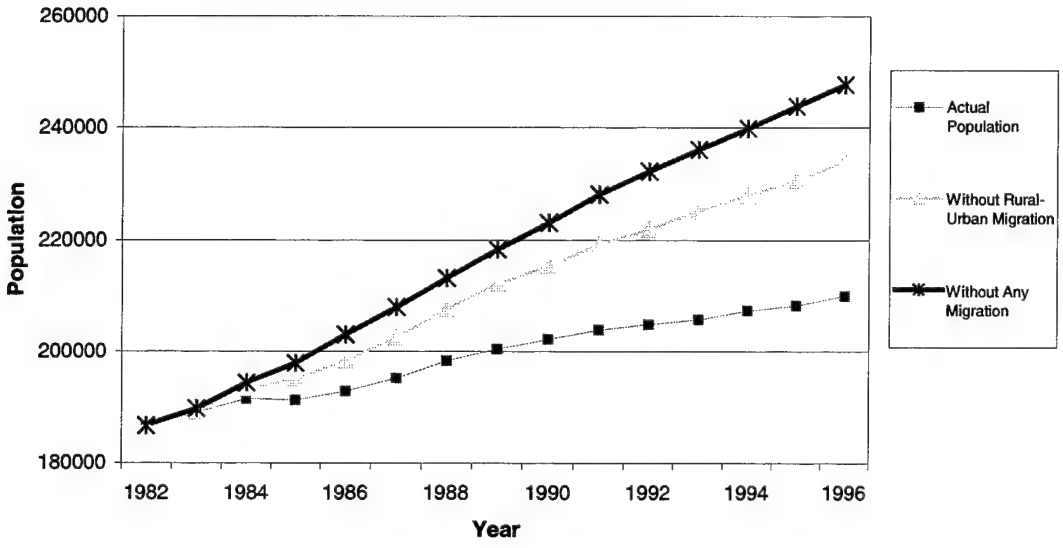
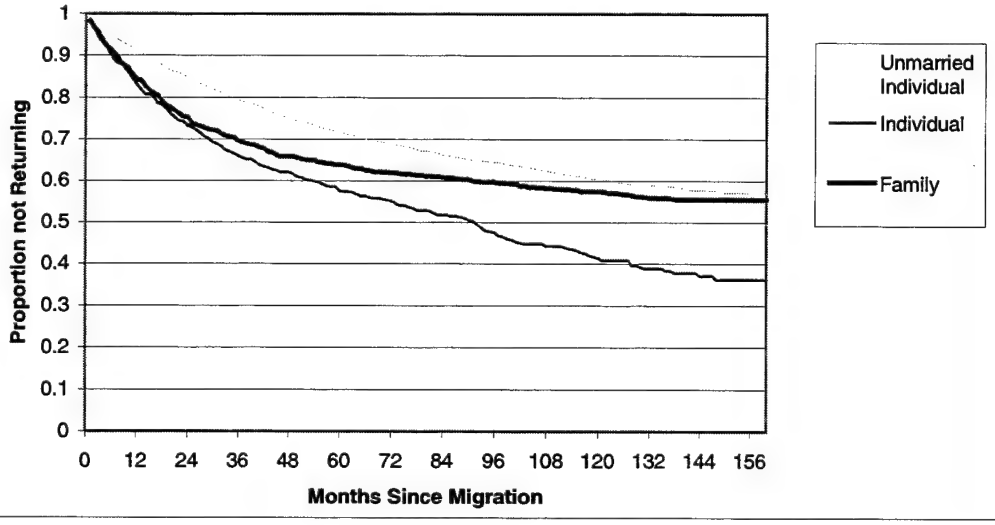


Figure 2: Survival Curves of Return Migration for Married Male Migrants



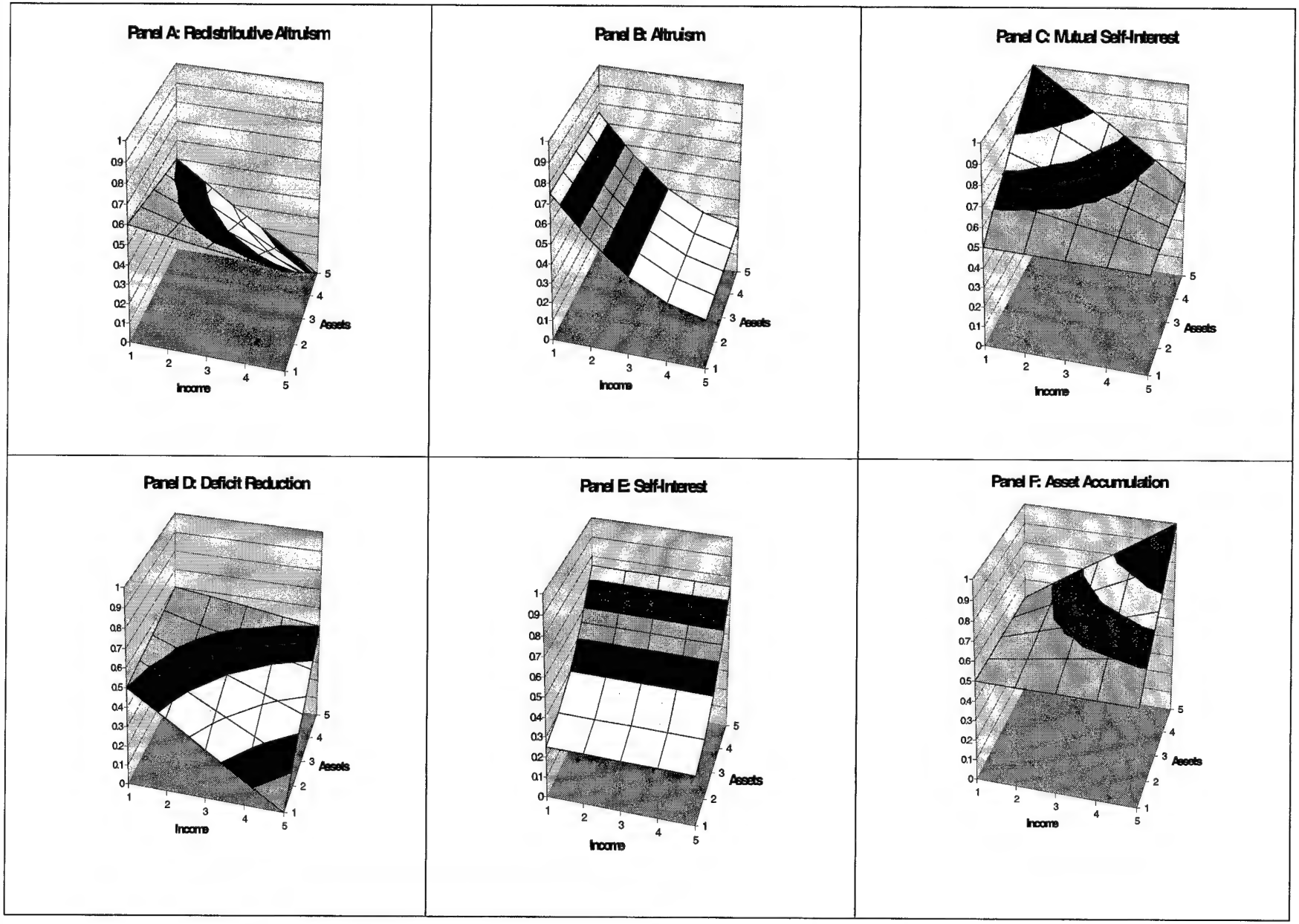


Figure 3: Hypothetical Appearance of Asset/Income/Transfer Surfaces

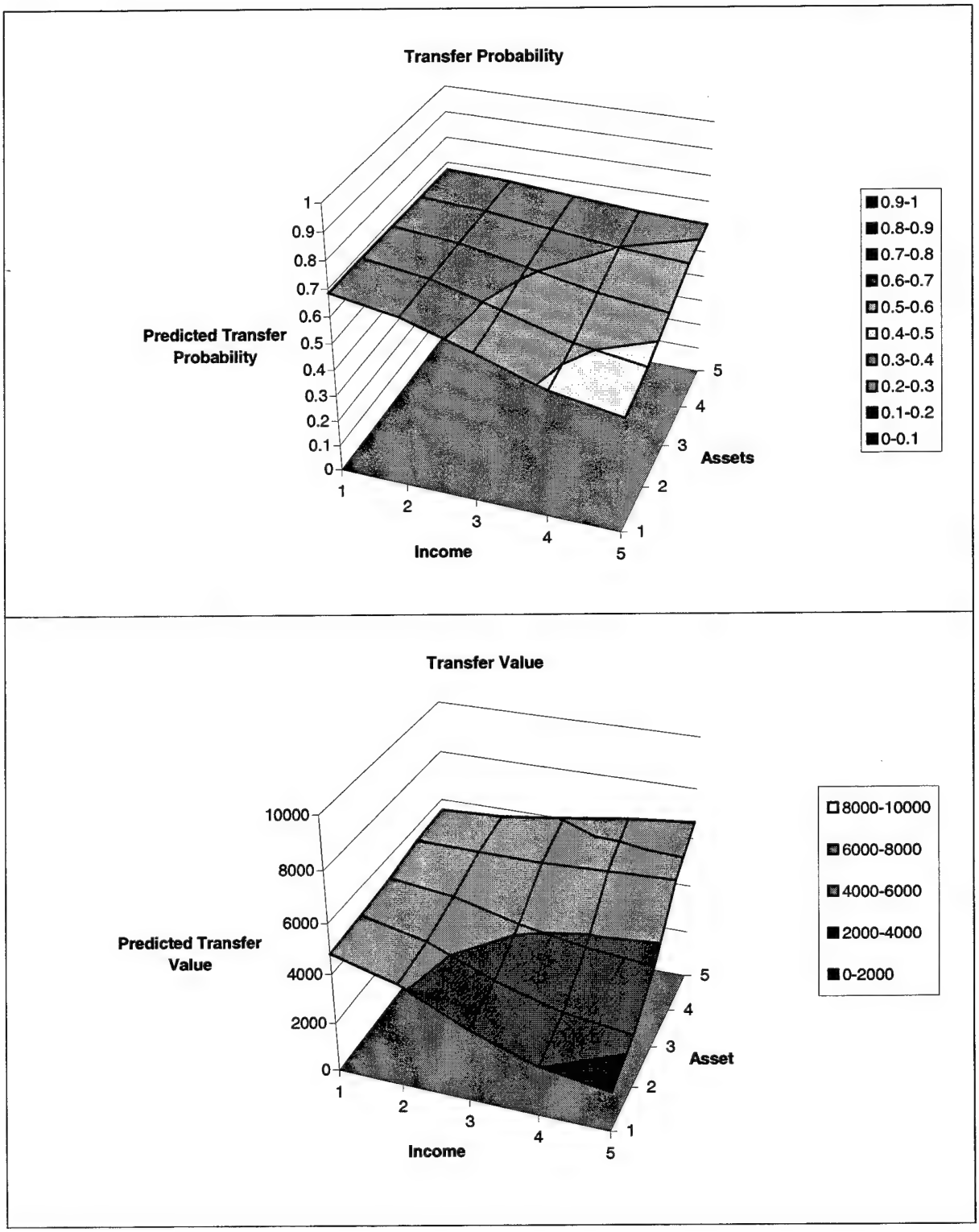


Figure 4: Surface Graphs of Assets, Income, and Transfers Patent-Level Analysis

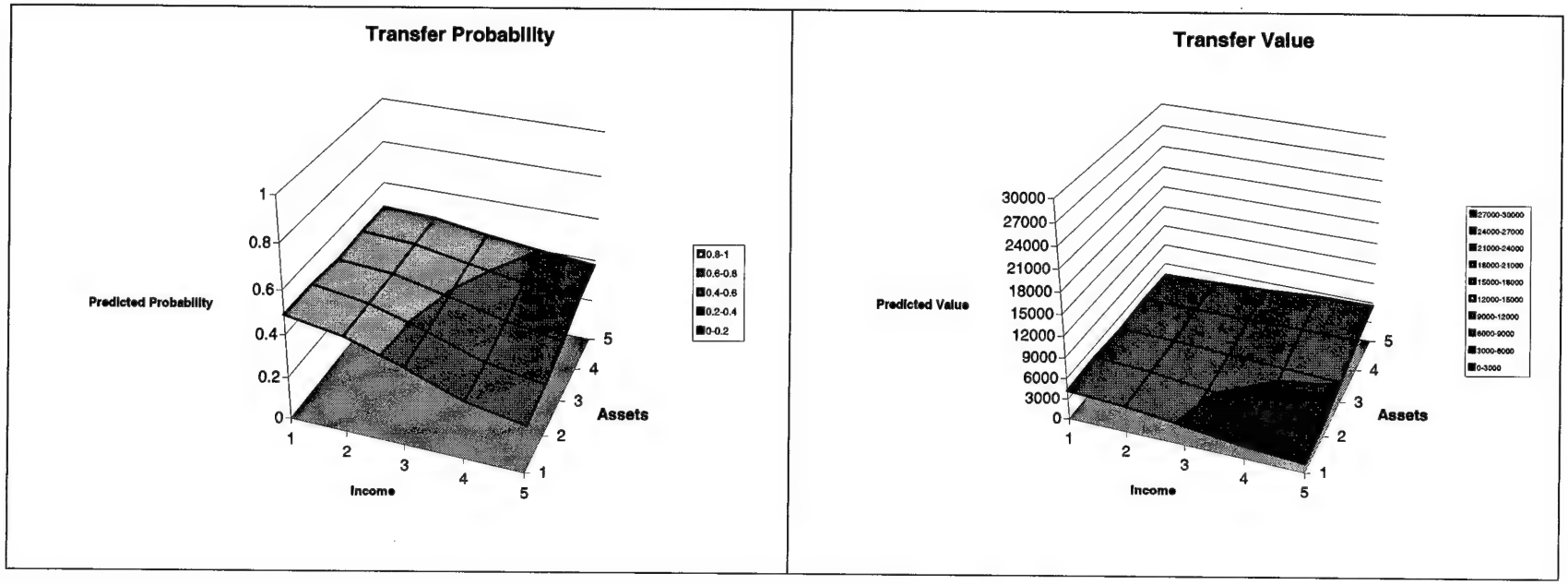


Figure 5. Transfer Patterns For Family Migrants

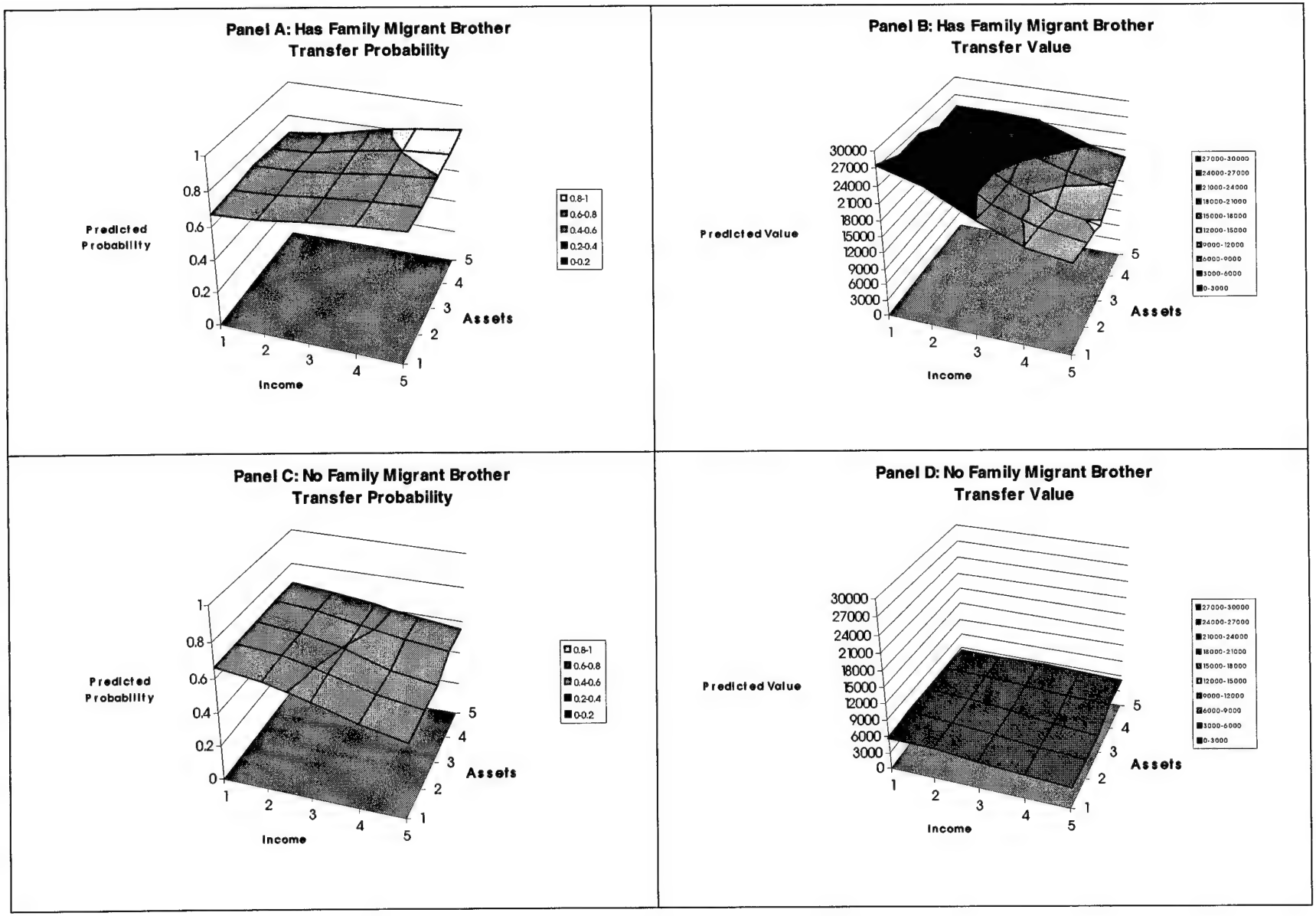


Figure 6: Transfer Patterns For Married Individual Migrants

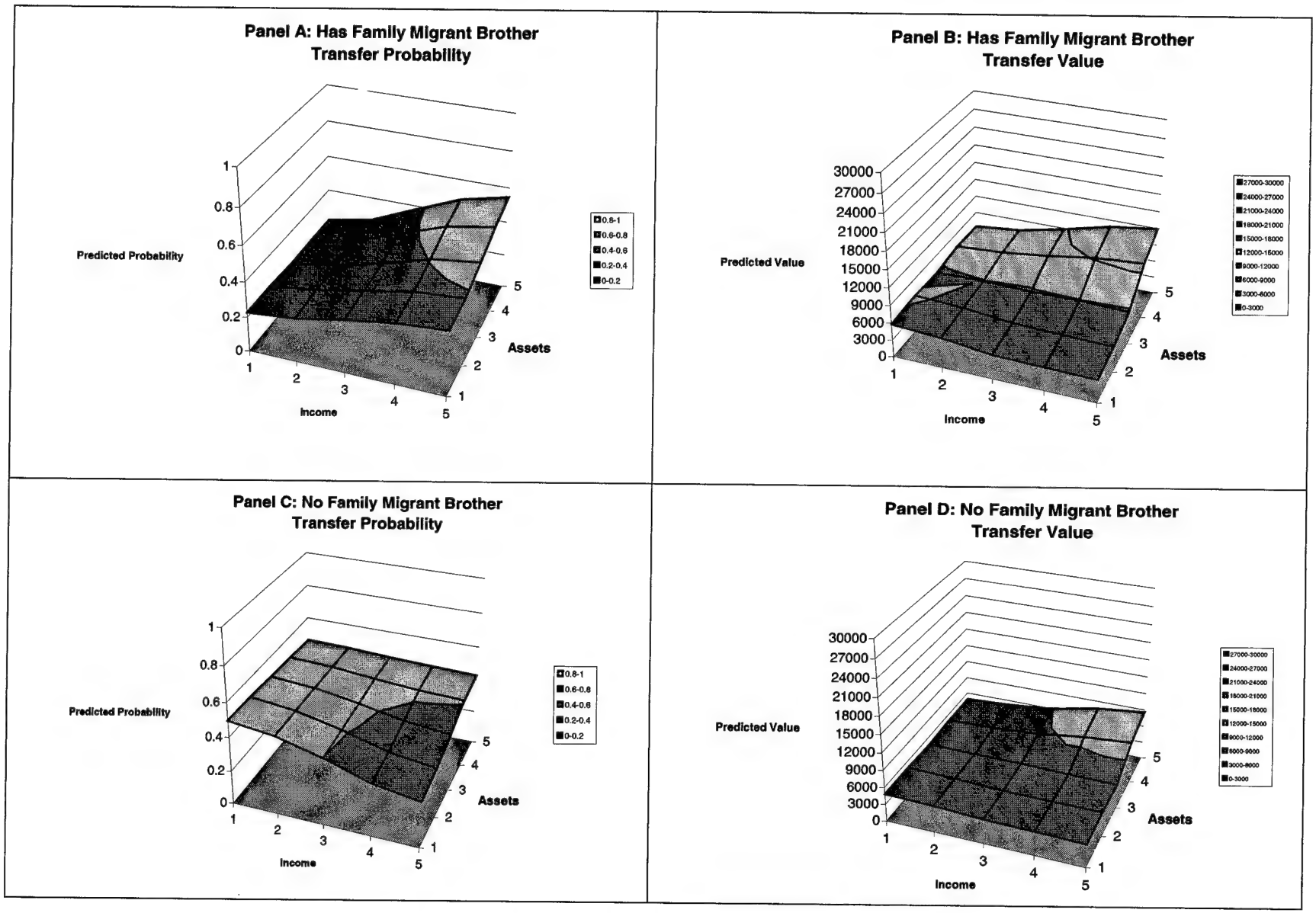


Figure 7: Transfer Patterns For Unmarried Individual Migrants

Appendix: Income and Asset Data

Variable Definition and Construction

Asset and income variables are based on Book II of the MHSS, which asked heads of households to report detailed accounts of all source of income, earned and non-earned, and all assets, productive and non-productive. Each asset and income variable will be discussed briefly.

Homestead Value: This variable is based on question *HA03* in the Household Assets module (HA), which asks for the market value of a given asset. The first line of that schedule asks about the value of the homestead land including house. Additionally, *HA04* and *HA05* ask about the value of any of that asset purchased or sold during the past year. These were subtracted out of the homestead value variable to remove the effects of homestead investments made as a result of remittances (all other assets were differenced in the same manner as well). Homestead values were truncated to limit the influence of some very large outliers by resetting values above the 98th percentile to the value of the 98th percentile. Their removal, which is not necessarily justified, reduces the mean value by 20% and reduces the standard error by 50%. The changes have little impact on the homestead value rankings employed in the analyses.

Value of Agricultural Assets: The Farm Business (FB) module asked a series of detailed questions about land ownership, shares in land, and income from land. Question *FB01T* asked for the amount of land owned in terms of a unit specified in *FB01B*. Question *FB02A* asked for the market value of that land and this was multiplied by the amount of land and the proportion of the land owned by household members (*FB05)*. In cases where the exact data on parcel size were not available, question *FB02c* asked a general question about the value of the holding. Using the same format, questions recorded the total value of ponds and orchards, agricultural equipment (mills, tractors, ploughs), and other items and buildings for use in agricultural production. The value of each reported asset category was truncated to limit the influence of large outliers by resetting all values above the 98th percentile to the value of the 98th percentile.

Total Assets: This variable consists of a sum of the two primary forms of asset used in the analysis combined with 1) all livestock assets, 2) all non-productive assets other than house and homestead (radios, televisions, jewelry, etc), and 3) all Non-Farm Business assets (NFB), including buildings, rickshaws, boats, carts, vans, nets, and looms for non-farm businesses.

Farm Income: Farm income consists of income earned from all of the productive assets included in sections HA, LI, and FB plus any earnings accrued by household members reported in the section for Agricultural Employment (AE). Income questions ask for the total earnings from the asset and any expenses accrued in earning that money. For important assets like land and cattle, questions about the share of the asset and the specific crops grown on land were also included. Agricultural profits come from the Agricultural Income (AI) section, which asks for sales in terms of the amount harvested and the sale price minus expenses for inputs, rentals, and harvest shares paid to land owners. The crops explored in these questions were the two major broadcast paddy harvests, *aman and aus*, plus a capital intensive harvest called *boro*, plus jute, wheat, mustard, potatoes, lentils, onions, vegetables, and others. The agricultural income section asked respondents to report, for any household member and for multiple occupations, the number of months in the year spent in a particular occupation, the number of days worked per month, the

number of hours worked per day, and the form of payment, which was costed out for cash and in-kind earnings. These were multiplied to achieve an income for each person-occupation.

Total Income: Total income includes all income included in the previous category, plus income earned from non-farm business assets included in section FB and any earnings accrued by household members reported in the section for non-Agricultural Employment (NAE). Section NFB functioned in much the same way as FB, asking for the earnings accrued off a particular business asset net of expenses in achieving those earnings. The NAE section functioned like the AE section, except that earnings were only calculated in terms of a monthly salary or total wage rather than a daily wage.

Descriptive Statistics of Income and Asset Measures

Table A.1 presents descriptive statistics for income and assets measures. The two primary asset measures employed in the analysis, homestead and agricultural land, are almost identical in terms of their means and medians, with both displaying a strong right skew. Holdings of any homestead assets are more universal than agricultural assets, with 5% holding any homestead assets compared to 16% holding any agricultural assets. In spite of this, the median agricultural asset value is actually slightly higher than the median homestead value. At the 98th percentile, where all values were clipped, this trend reverses again, with homestead assets peaking much higher than agricultural assets. Total income is also strongly right-skewed. Incomes can range below zero since income measures include expenditures in the production process, and thus 7% of all respondents had negative total household incomes.

Table A.2 displays correlations between absolute and relative measures of the income and asset measures used in the analysis as well as a measure of only agricultural income and a composite asset measures. In the year of survey, the absolute measure of agricultural assets had a stronger correlation with agricultural income than did homestead assets, but a weaker correlation with total income. When relative measures are used, the asset rankings have a similar correlation with the income rankings (0.20 for agricultural, 0.19 for homestead), although agricultural assets perform better when both are used jointly to predict income.

The fact that what are constrasted as productive and non-productive assets have similar correlation with income is largely a function of the unpredictability of agricultural production. In qualitative interviews, respondents claim that the actual profits derived from cultivation are limited by (relatively) high and fluctuating labor costs, input costs, and the high level of agricultural risk that facilitates an analysis of income/asset interactions. While the region as a whole derives extensive indirect income from agricultural cultivation through capital rentals at the top and commodified labor at the bottom, direct profit from cultivation is limited and a significant proportion of households experience at least one year of negative income every few years. This unpredictability is what facilitates the analysis of relative deficits in income relative to agricultural assets. Because of the high variance in agricultural profitability, the long-term correlation between agricultural assets and income is reduced in any given year by frequent income shocks in this form of production. This introduces a striking diversity of asset/income profiles, with reasonable numbers of both low income / high asset and high income / low asset respondents (Table A.3).

Table A.1: Detailed Distribution of Asset and Income Measures

Quantile	Homestead Assets	Agricultural Assets	Total Income	Total Assets	Agricultural Income
1%	0	0	-11,800	0	-13,750
5%	0	0	-1,200	7,450	-3,100
10%	8,000	0	0	19,900	-988
25%	30,000	10,000	3,600	65,400	125
50%	60,000	76,000	13,890	174,400	3,715
75%	120,000	216,000	34,320	401,600	10,750
90%	282,000	450,000	67,200	880,200	19,075
95%	600,000	630,000	102,380	1,308,600	32,225
98%	1,500,000	1,199,950	260,700	3,064,000	70,160
Mean	137,745	164,619	28,371	368,141	7,909
Median	258,914	236,009	48,119	675,033	18,135

All values in Bangladeshi taka (1996 exchange rate is Tk45 = US$1)

Table A.2: Correlation of Asset and Income Measures

	Homestead Assets	Agricultural Assets	Total Income	Homestead Asset Percentile	Agricultural Asset Percentile	Total Income Percentile	Total Assets	Agricultural Income
Homestead Assets	1.00							
Agricultural Assets	0.29	1.00						
Total Income	0.27	0.20	1.00					
Homestead Asset Percentile	0.61	0.48	0.25	1.00				
Agricultural Asset Percentile	0.31	0.77	0.17	0.57	1.00			
Total Income Percentile	0.17	0.19	0.64	0.19	0.20	1.00		
Total Assets	0.76	0.56	0.29	0.53	0.46	0.23	1.00	
Agricultural Income	0.26	0.33	0.50	0.21	0.31	0.37	0.32	1.00

Table A.3: Joint Quintile Distribution of Agricultural Assets and Total Income

	Income					
Agricultural Assets	1st Quntile	2nd Quintile	3rd Quintile	4th Quintile	5th Quintile	Total
1st Quintile	49	25	41	28	15	158
	6.2%	**3.2%**	**5.2%**	**3.5%**	**1.9%**	20.0%
2nd Quintile	27	36	39	41	32	175
	3.4%	**4.6%**	**4.9%**	**5.2%**	**4.0%**	22.1%
3rd Quintile	34	24	31	42	30	161
	4.3%	**3.0%**	**3.9%**	**5.3%**	**3.8%**	20.3%
4th Quintile	21	24	33	39	31	148
	2.7%	**3.0%**	**4.2%**	**4.9%**	**3.9%**	18.7%
5th Quintile	15	29	27	33	46	150
	1.9%	**3.7%**	**3.4%**	**4.2%**	**5.8%**	18.9%
Total	146	138	171	183	154	792
	18.4%	17.4%	21.6%	23.1%	19.4%	100.0%

Note: Non-bold values are raw numbers. Values in bold are cell percents (4% in each would be even distribution, observations only on diagonal would indicate strong correlation).

Table A.4: Distribution of Variables in Parent-Level Models

	Parent-Level		Child-Level		Range	
Variable	Mean	S.D.	Mean	S.D.	Min	Max
Transfer Probability	0.57	0.50	0.47	0.50	0	1
Total Transfer Value	15678	49982	9390	36540	0	620000
(If Any Transfer)	27566	63783	19924	51237	0	620000
Transfer Value per Migrant Son	9462	29666	---	---	0	400000
(If Any Transfer)	16638	37806	---	---	0	400000
Male in Couple not Present	0.30	0.46	0.31	0.46	0	1
Female in Couple not Present	0.05	0.21	0.05	0.22	0	1
Age of Male in Couple	58.83	10.08	59.24	10.38	50	95
Age of Female in Couple	54.75	9.15	55.48	8.91	26	85
Schooling of Female in Couple	3.46	3.12	3.50	3.15	0	14
Schooling of Female in Couple	1.29	2.19	1.31	2.20	0	11
Children in Household	1.87	1.54	1.72	1.51	0	9
Unmarried Sons in Household	0.71	0.95	0.67	0.95	0	6
Married Daughters in Household	0.07	0.25	0.06	0.24	0	1
Unmarried Daughters in Household	0.35	0.61	0.32	0.59	0	4
Non-Sample Children Outside Household	2.21	1.56	2.20	1.47	0	8
Daughters Living Outside Household, in District	0.99	1.06	0.98	1.06	0	6
Daughters Living Outside District or Country	0.65	0.97	0.68	0.97	0	6
Total Number of Children in Sample	1.67	0.93	2.19	1.15	1	6
Child's Own Education	---	---	6.58	4.52	0	1
Children's Average Education	6.43	4.26	6.58	4.15	0	17
Child's Own Age	---	---	31.65	7.97	0	1
Children's Average Age	31.25	7.59	31.65	7.24	15	67
Child's Own Years Away	---	---	8.39	7.94	0	1
Children's Average Years Away	27.30	38.33	27.96	38.15	0	99
Child is a Family Migrant	---	---	0.44	0.50	0	1
Number of Family Migrant Children	0.82	0.92	1.11	1.16	0	5
Child is an Interantional Migrant	---	---	0.30	0.46	0	1
Number of International Migrant	0.49	0.74	0.62	0.88	0	4
Child is Enrolled in School	---	---	0.05	0.22	0	1
Number of Migrant Children in School	0.09	0.33	0.13	0.39	0	2

Total Observations = 792

Table A.5: Parent-Level Transfer Models (Controls included)

	Model 1			Model 2		
	(1)	(2)	(3)	(1)	(2)	(3)
	Any Transfer	Average Transfer Value	Total Transfer Value	Any Transfer	Average Transfer Value	Total Transfer Value
Male in Couple not Present	0.117	-0.874*	-0.937*	-0.036	-1.035**	-1.108**
	(0.510)	(0.511)	(0.518)	(0.502)	(0.492)	(0.493)
Female in Couple not Present	-0.256	-0.858**	-0.469	-0.246	-0.985**	-0.583
	(0.568)	(0.435)	(0.462)	(0.582)	(0.435)	(0.450)
Age of Male in Couple	0.003	-0.018	-0.020	-0.001	-0.021	-0.023
	(0.020)	(0.020)	(0.021)	(0.020)	(0.019)	(0.021)
Age of Female in Couple	0.030	-0.016	-0.008	0.031*	-0.017	-0.009
	(0.018)	(0.016)	(0.016)	(0.018)	(0.016)	(0.016)
Schooling of Male in Couple	-0.006	0.003	0.009	-0.010	-0.008	-0.001
	(0.040)	(0.037)	(0.038)	(0.040)	(0.035)	(0.035)
Schooling of Female in Couple	0.032	0.086	0.083	0.027	0.065	0.062
	(0.060)	(0.060)	(0.064)	(0.058)	(0.055)	(0.058)
Children in Household	-0.396**	0.072	-0.001	-0.382**	0.106	0.034
	(0.157)	(0.170)	(0.171)	(0.157)	(0.178)	(0.178)
Unmarried Sons in Household	0.426**	-0.015	0.022	0.410**	-0.026	0.010
	(0.173)	(0.182)	(0.186)	(0.174)	(0.191)	(0.194)
Married Daughters in Household	0.359	0.554	0.763	0.324	0.427	0.638
	(0.510)	(0.495)	(0.496)	(0.506)	(0.496)	(0.489)
Unmarried Daughters in Household	0.281*	0.089	0.104	0.263	0.074	0.089
	(0.163)	(0.142)	(0.147)	(0.161)	(0.135)	(0.139)
Non-Sample Children Outside Household	-0.075	-0.309**	-0.359**	-0.071	-0.292**	-0.342**
	(0.147)	(0.108)	(0.113)	(0.149)	(0.102)	(0.108)
Daughters Living Outside Household, in District	0.120	0.312**	0.349**	0.118	0.307**	0.343**
	(0.175)	(0.141)	(0.142)	(0.175)	(0.130)	(0.134)
Daughters Living Outside District or Country	0.147	0.289**	0.325**	0.140	0.265*	0.302**
	(0.176)	(0.144)	(0.155)	(0.177)	(0.138)	(0.151)
Household Homestead Value Percentile	1.091**	1.026**	1.042**	1.689*	1.203*	1.294
	(0.439)	(0.373)	(0.386)	(0.973)	(0.692)	(0.792)
Household Agricultural Value Percentile	0.834**	1.296**	1.451**	-0.471	-0.142	-0.031
	(0.410)	(0.370)	(0.378)	(1.005)	(0.805)	(0.864)
Household Income per Capita Percentile	-1.313**	-0.953**	-1.218**	-1.923**	-3.211**	-3.397**
	(0.395)	(0.311)	(0.310)	(0.788)	(0.606)	(0.604)
Agricultural Percentile * Homestead Percentile				0.056	-0.595	-0.556
				(1.291)	(1.077)	(1.166)
Homestead Land Percentile * Income Percentile				-1.171	0.315	0.103
				(1.501)	(1.300)	(1.400)
Agricultural Land Percentile*Income Percentile				2.451*	4.079**	4.130**
				(1.405)	(1.270)	(1.445)
Constant	-1.639	9.690**	9.913**	-1.113	10.698**	10.896**
	(1.328)	(1.092)	(1.285)	(1.362)	(1.082)	(1.250)
Observations	792	451	451	792	451	451
R-squared	0.08	0.29	0.29	0.08	0.32	0.32
Log Likelihood	40.5	10.5	11.9	48.1	12.4	13.8

Robust standard errors in parentheses
*significant at 10%; **significant at 5%

Table A.6: Single Equation Child-Level Transfer Models

	Model 3	Model 4
Household Homestead Value Percentile	1.782**	-0.047
	(0.722)	(1.227)
Household Agricultural Value Percentile	-0.747	0.711
	(0.991)	(1.864)
Household Income per Capita Percentile	-3.855**	-3.289**
	(0.903)	(1.168)
Agricultural Land Percentile * Income Percentile	4.162**	3.289
	(1.588)	(2.824)
Sibling Mean Education	-0.013	-0.001
	(0.090)	(0.088)
Child's Own Education	0.142*	0.141
	(0.075)	(0.118)
Sibling Mean Age	-0.078	-0.076
	(0.054)	(0.053)
Child's Own Age	0.080*	0.078*
	(0.047)	(0.047)
Sibling Mean Years in Destination	0.001	0.002
	(0.005)	(0.005)
Child's Own Years in Destination	0.031	0.030
	(0.025)	(0.025)
Total Number of Children in Sample	-0.308*	-0.301*
	(0.159)	(0.160)
Child is Family Migrant	-0.293	-0.279
	(0.550)	(0.545)
Any Sibling in Family is Family Migrant	-0.527	-0.547
	(0.575)	(0.572)
Child is International Migrant	2.027**	2.102**
	(0.548)	(0.554)
Number of International Migrant Children	-0.622**	-0.647**
	(0.278)	(0.281)
Child is in School	-3.454**	-3.502**
	(1.078)	(1.071)
Total Number of Siblings in School	0.009	0.081
	(0.706)	(0.695)
Own Education * Homestead Percentile		0.247*
		(0.133)
Own Education * Agriculutral Percentile		-0.219
		(0.211)
Own Education * Income		-0.127
		(0.176)
Own Education * Income * Agricultural Percentile		0.180
		(0.331)
Constant	2.409	2.302
	(2.010)	(2.115)
Observations	1323	1323
R-squared	0.18	0.19

Robust standard errors in parentheses
*significant at 10%; **significant at 5%